



NWT Climate
Change Action Plan:
ANNUAL REPORT 2020-21

RAPPORT ANNUEL 2020-21
sur le Plan d'action
sur le changement
climatique des TNO

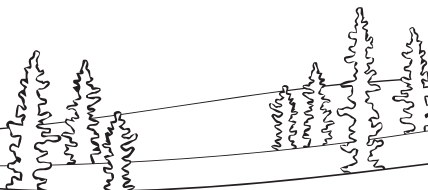
Le présent document contient la traduction
française du résumé et du message du ministre.

Government of Northwest Territories
Gouvernement des Territoires du Nord-Ouest

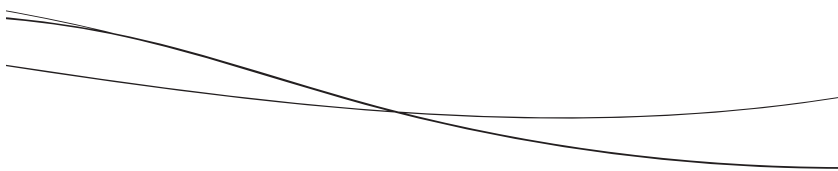


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Government of the Northwest Territories Departments and Agencies

Abbreviations and Acronyms	Partners	Abbreviations and Acronyms	Partners
ECE	Department of Education, Culture and Employment	ISSC	Informatics Shared Services Centre
ECE (ARI)	Department of Education, Culture and Employment (Aurora Research Institute)	ITI	Department of Industry, Tourism and Investment
EIA	Department of Executive and Indigenous Affairs	ITI (NTGS)	Department of Industry, Tourism and Investment (Northwest Territories Geological Survey)
ENR	Department of Environment and Natural Resources	Lands	Department of Lands
FIN	Department of Finance	MACA	Department of Municipal and Community Affairs
HSS	Department of Health and Social Services	NTPC	Northwest Territories Power Corporation
INF	Department of Infrastructure	NWTHC	NWT Housing Corporation
-	Academia	AEA	Arctic Energy Alliance
-	Co-management Boards	NGOs	Non-governmental organizations
-	Community Governments	NWTAC	Northwest Territories Association of Communities

Abbreviations and Acronyms	Partners	Abbreviations and Acronyms	Partners
IGOs	Indigenous governments and organizations	NWT CISPP	NWT Council on Invasive Species, Pests and Pathogens
-	Industry	LGANT	Local Government Administrators of the NWT
CanNor	Canadian Northern Economic Development Agency	ISC	Indigenous Services Canada
CIRNAC	Crown Indigenous Relations and Northern Affairs Canada	NRC	National Research Council
DFO	Fisheries and Oceans Canada	NRCan	Natural Resources Canada
ECCC	Environment and Climate Change Canada	NRCan (CCMEO)	Canada Centre for Mapping and Earth Observation
ECCC (CCCS)	Canadian Centre for Climate Services	NRCan (CFS)	Canadian Fire Service
ECCC (CWS)	Canadian Wildlife Service	NRCan (GSC)	Geological Survey of Canada
ECCC (MSC)	Meteorological Service of Canada	PCA	Parks Canada Agency
HC	Health Canada	PSC	Public Safety Canada
INFC	Infrastructure Canada	SCC	Standards Council of Canada

¹ Co-management Boards is intended to capture regulatory boards, such as land and water boards, renewable resources boards, and/or land use planning boards and committees.

Minister's Message



**The Honourable
Shane Thompson**
*Minister of Environment
and Natural Resources*

Climate change is one of the most fundamental challenges of our time, across the globe – and Northerners know that better than anyone.

We see it in heat waves across the territories; shortened ice road seasons; permafrost slumps affecting roads; and changes to wildlife migrations.

Our government takes these challenges seriously, and in response, has developed coordinated action on climate change to support a strong, resilient territory for future generations.

This work is guided by the 2030 NWT Climate Change Strategic Framework (CCSF) released in May 2018, and the 2030 NWT Climate Change Strategic Framework 2019-2023 Action Plan (Action Plan) released in April 2019.

In 2020-2021, faced with challenges due to the COVID-19 pandemic, I am pleased to say we continued to make real progress.

Of the 104 action items identified in part one of our Action Plan, 11 are complete, while 92 are underway. Furthermore, 24 of 57 tasks have been initiated from part two of the Action Plan.

Highlights from our work include a further 3.6 kilotonne reduction in greenhouse gas emissions, the establishment of the NWT Climate Change Council, the addition of 15 new climate change-related jobs across five GNWT departments, and 27 climate change projects funded by the NWT Cumulative Impact Monitoring Program.

The CCSF, implemented in tandem with the 2030 Energy Strategy and the NWT's Carbon tax, form the pillars of our government's response to climate change. These pillars provide a clear path forward with actions to reduce greenhouse gas emissions and adapt our communities to be more resilient to climate change.

Our government is continuing to address the immense challenge of climate change with meaningful action and leadership. In partnership with Indigenous governments and organizations, community leadership, co-management boards, academia, industry, non-governmental organizations, and the federal government, we are collectively stepping up and playing crucial roles to realize a shared vision for a territory healthy and resilient in the face of this generational challenge.

You will find examples of this spirit of collaboration and partnership throughout this report. And I look forward to continuing to work with partners across our territory to build on our existing knowledge and take action to tackle climate change and build a sustainable future for all Northerners.

The Honourable Shane Thompson

Minister, Environment and Natural Resources

Photo: North Arm of Great Slave Lake, Dinàgà Wek'èhodi, NWT



Executive Summary

The Government of the Northwest Territories' Mandate for 2019-2023 prioritizes a strengthened commitment to climate change. This includes building greater leadership and authority on climate change, making climate change a consideration for government decisions, and developing more alternative and renewable energy while stabilizing power costs.

Achieving this Mandate is guided by key GNWT initiatives:

- 2030 NWT Climate Change Strategic Framework
- 2030 Energy Strategy
- NWT Carbon Tax

This is the second-annual report of the *Climate Change Action Plan – 2019-2023*, which provides concrete actions the GNWT and partners must strive to complete to help realize the vision outlined in the Climate Change Strategic Framework.

GOALS OF THE CLIMATE CHANGE ACTION PLAN

1. Transition to a strong, healthy economy that uses less fossil fuel, thereby reducing greenhouse gas emissions by 30% below 2005 levels by 2030.
2. Improve knowledge of the climate change impacts occurring in the NWT.
3. Build resilience and adapt to a changing climate.

The cross-cutting themes are leadership, communication and capacity-building, and economic impacts and opportunities. The

cross-cutting themes include actions which can apply to all three goals.

PARTNERSHIP

While the GNWT recognizes its leadership in addressing climate change, it is a shared responsibility not possible without hard work of many partners.

Partners in NWT climate action include:

- Indigenous Governments and Organizations
- Co-management boards
- Community Governments
- Non-governmental organizations
- Academia
- Industry
- Other territorial governments
- Government of Canada

Examples of these partnerships can be found throughout this report.

ACTIONS

The Action Plan is divided into two sections:

- **Part one:** actions which were underway or will be

resourced within 2019-2023

- o 104 actions

- **Part two:** high priority actions which requiring longer-term work, partnership, or resources than may be achieved within the first five years of implementation

- o 28 actions

PROGRESS

Even with the challenges posed by the COVID-19 pandemic, progress continued to be made on part 1 and 2 actions during 2020-2021.

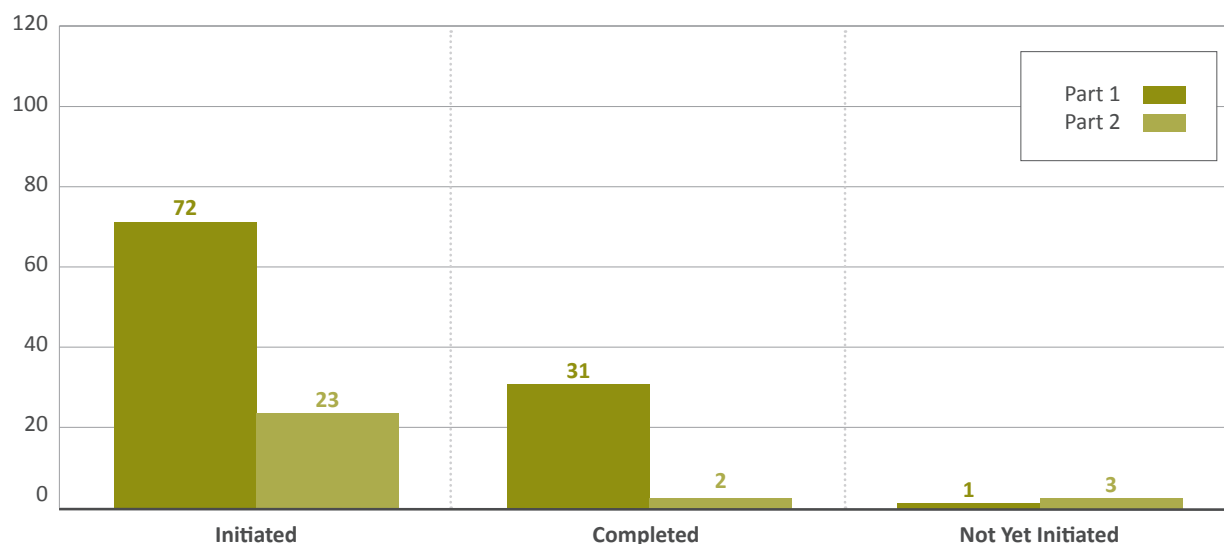
For the purposes of reporting, actions have been designated as “initiated,” “completed,” or “not yet initiated.”

An action is considered “initiated” once work has begun on achieving that action or substantive progress has been made towards implementation

- An action is considered “completed” if the final milestone(s) are met and ongoing implementation continues
- An action is considered “not yet initiated” if work has not begun on that action

Below is a summary of implementation progress as of March 31, 2021, which builds on progress made in 2019-20.

FIGURE 1. OVERVIEW OF IMPLEMENTATION PROGRESS AS OF MARCH 31, 2021.



HIGHLIGHTS

The following are progress highlights for 2020-2021.

Goal 1: Transition to a Lower Carbon Economy

- Invested \$38.0 million in energy projects in all NWT communities
- Reduced NWT Greenhouse Gas (GHG) emissions by an additional 3.6 kilotonnes CO_{2e}
- Continued to develop projects improving NWT energy system's reliability while stabilizing residents' energy bills
- Continued to implement the NWT Carbon Tax
- Signed an agreement with NTPC to improve accuracy of utility data tracking

Goal 2: Improve Knowledge of Climate Change Impacts

- Continued community-based monitoring and research, involving youth, while ensuring compliance with COVID-19 restrictions
- Secured funding to support community government core needs, including infrastructure impacted by climate change
- Established mechanisms for climate change-related human health and public safety messaging
- Installed a permafrost ground temperature monitoring network along the Dempster and Inuvik Tuktoyaktuk highways
- Inspected infrastructure, including tracking for potential impacts of climate change
- Advanced mapping of four permafrost geohazard themes to inform community hazard maps, and completion and **publication of the Organic Terrain theme**
- Established the NWT Pests, Pathogens and Invasive Species Council
- Expanded monitoring of wildlife to further track ranges of native and non-native species was undertaken
- Initiated research to evaluate potential climate change impacts on snow accumulation in the NWT
- Partners completed several wetland inventory projects in protected areas

- Initiated/completed several vulnerability and risk assessments for wildlife, forests, protected areas, human health, cultural places, and infrastructure
- Responded to permafrost slumps and thaws, as they impacted infrastructure

Goal 3: Build Resilience and Adapt to a Changing Climate

- Formed the Thaidene Nënë and Ts'udé Niljné Tuyeta protected areas management boards
- Continued the co-management and conservation of caribou in a changing climate
- Initiated development of

an overall Climate Change Adaptation Strategy for wildlife in the NWT

- Implemented community adaptation measures, including FireSmarting and Community Wildfire Protection Plans
- Supported increased production of local agriculture products on established and growing farms
- Supported on the land activities to promote food security
- Progressed on the construction of multiple all-season roads

INTEGRATED CLIMATE CHANGE REPORTING

To provide a full picture of what has been done by the GNWT and its partners to address climate change across the three key components of its climate action approach, a plain language report has been published summarizing all progress under these initiatives.

You can find the integrated report at www.enr.gov.nt.ca.

Sommaire

Dans son mandat pour 2019-2023, le gouvernement des Territoires du Nord-Ouest accorde la priorité à un engagement renforcé vis-à-vis du changement climatique.

Il compte notamment faire preuve d'un plus grand leadership et d'une plus grande autorité en matière de changement climatique, faire en sorte que le changement climatique soit pris en considération dans les décisions gouvernementales et favoriser davantage le recours aux énergies de remplacement et aux énergies renouvelables tout en stabilisant les coûts de l'électricité.

La réalisation de ce mandat est guidée par des initiatives clés du GTNO, à savoir :

- le Cadre stratégique sur le changement climatique des TNO pour 2030;
- la Stratégie énergétique 2030;
- la Taxe sur le carbone aux TNO.

Il s'agit du deuxième rapport annuel relatif au **Plan d'action sur le changement climatique pour 2019 2023** à présenter des mesures concrètes que le GTNO et ses partenaires doivent mener à bien afin de concrétiser la vision décrite dans le Cadre stratégique sur le changement climatique.

OBJECTIFS DU PLAN D'ACTION SUR LE CHANGEMENT CLIMATIQUE

1. Assurer la transition vers une économie saine et forte moins dépendante des combustibles fossiles, de façon à réduire les émissions de gaz à effet de serre de 30 % par rapport au niveau de 2005 d'ici 2030.
2. Mieux comprendre les effets du changement climatique aux TNO.
3. Accroître l'autonomie et s'adapter aux changements climatiques.

Les thèmes transversaux sont d'une part le leadership, la communication et le renforcement des capacités et, d'autre part, les répercussions et les possibilités économiques.

PARTENARIAT

Même si le GTNO reconnaît son rôle vis-à-vis du changement climatique, il s'agit d'une responsabilité partagée qui ne peut être assumée sans les efforts soutenus de nombreux partenaires.

Ces partenaires comprennent :

- Les gouvernements et les organisations autochtones
- Les conseils de cogestion
- Les administrations communautaires
- Les organisations non gouvernementales
- Le milieu universitaire
- Les industries
- Les autres gouvernements territoriaux
- Le gouvernement du Canada

Des exemples de ces partenariats sont présentés dans le présent rapport.

MESURES PRISES

Le plan d'action est divisé en deux parties.

- Partie 1 : les mesures en cours ou qui seront financées entre 2019 et 2023.
 - o 104 mesures
- Partie 2 : les mesures hautement prioritaires qui exigent que des travaux, des partenariats ou des ressources soient étalés sur une plus longue période que les cinq premières années de mise en œuvre.
 - o 28 mesures

PROGRÈS

Malgré les défis posés par la pandémie de COVID-19, des progrès ont été réalisés en 2020-2021 en ce qui concerne les mesures des parties 1 et 2.

Dans le cadre du présent rapport, les mesures ont été catégorisées comme étant *amorçées*, *terminées* ou *non amorçées*.

- Une mesure est considérée comme **amorçée** lorsque les travaux menant à sa réalisation ont commencé ou que des progrès substantiels ont été réalisés en vue de sa mise en œuvre.

- Une mesure est considérée comme **terminée** si les derniers jalons sont atteints et que la mise en œuvre se poursuit.
- Une mesure est considérée comme **non amorcée** si les travaux s'y rapportant ne sont pas commencés.

Vous trouverez ci-dessous un résumé des progrès réalisés dans la mise en œuvre des mesures en date du 31 mars 2021 à la suite des progrès réalisés en 2019-2020.

FIGURE 1 : APERÇU DES PROGRÈS RÉALISÉS DANS LA MISE EN ŒUVRE EN DATE DU 31 MARS 2021.

Implementation Progress as of March 31, 2021	Progrès réalisés en date du 31 mars 2021
Part 1 actions	Mesures de la partie 1
Part 2 actions	Mesures de la partie 2
Initiated	Amorcée
Completed	Terminée
Not Yet Initiated	Non amorcée

FAITS SAILLANTS

Voici les faits saillants des progrès réalisés en 2020-2021.

Objectif no 1 : établir une économie à faibles émissions de carbone

- Investissement de 38 millions de dollars dans des projets énergétiques dans toutes les collectivités des TNO.
- Réduction des émissions de gaz à effet de serre (GES) des TNO de 3,6 kilotonnes de CO2 supplémentaires.

- Poursuite de la mise en œuvre de projets visant à améliorer la fiabilité du système énergétique des TNO tout en stabilisant les factures d'électricité des Ténos.
- Poursuite de l'application de la Taxe sur le carbone des TNO.
- Signature d'un accord avec la Société d'énergie des TNO (SETNO) pour améliorer la précision du suivi des données sur les services publics.

Objectif no 2 : développement des connaissances sur les répercussions des changements climatiques

- Poursuite de la surveillance et de la recherche communautaires avec la participation de jeunes tout en garantissant le respect des restrictions liées à la COVID-19.
- Obtention d'un financement pour répondre aux besoins essentiels des administrations

communautaires, y compris les infrastructures touchées par le changement climatique.

- Mise en place de mécanismes pour diffuser des messages sur la santé et la sécurité publique liés au changement climatique.
- Installation d'un réseau de surveillance de la température du pergélisol le long des routes Dempster et Inuvik-Tuktoyaktuk.
- Inspection des infrastructures, y compris un suivi des répercussions potentielles du changement climatique.
- Cartographie détaillée de quatre thèmes de géorisques liés au pergélisol pour alimenter les cartes de risques communautaires; **fin et publication du thème sur le terrain organique.**
- Création du Conseil sur les organismes nuisibles, agents pathogènes et espèces envahissantes des TNO.
- Surveillance accrue de la faune et de la flore afin d'assurer un meilleur suivi des aires de répartition des espèces indigènes et exotiques.
- Lancement d'un projet de recherche pour évaluer les répercussions potentielles du changement climatique sur l'accumulation de neige aux TNO.
- Fin de plusieurs projets d'inventaire des milieux humides dans les aires protégées menés par des partenaires.

- Lancement et fin de plusieurs évaluations de la vulnérabilité de la faune, des forêts, des aires protégées, de la santé humaine, des lieux culturels et des infrastructures ainsi que des risques connexes.
- Mesures mises en œuvre aux endroits où des effondrements et le dégel du pergélisol ont endommagé des infrastructures.

Objectif no 3 : accroître l'autonomie et s'adapter aux changements climatiques

- Création de conseils de gestion pour les aires protégées de Thaidene Nënë et Ts'udé Niljné Tuyeta.
- Poursuite de la cogestion et de la conservation du caribou dans un climat en évolution.
- Mise en œuvre d'une stratégie globale d'adaptation au changement climatique pour la faune des TNO.
- Mise en œuvre de mesures d'adaptation pour les collectivités, notamment des plans de prévention des incendies et des plans communautaires de protection contre les incendies de forêt.
- Soutien visant à augmenter la production agricole locale dans les fermes établies et en croissance.
- Soutien des activités sur le terrain visant à promouvoir la sécurité alimentaire.
- Progression de la construction de plusieurs routes praticables en toutes saisons.

RAPPORT INTÉGRÉ SUR LE CHANGEMENT CLIMATIQUE

Afin de présenter une vue d'ensemble de ce qui a été fait par le GTNO et ses partenaires pour affronter le changement climatique dans le cadre des trois initiatives clés de son approche en matière d'action climatique, un rapport en langage clair a été publié. Ce rapport résume tous les progrès réalisés dans le cadre de ces initiatives.

Le rapport intégré se trouve sur le site Web www.enr.gov.nt.ca/fr.

1.0 Introduction

Climate change impacts many aspects of life in the Northwest Territories (NWT), including the natural environment, the health and safety of its residents, the culture and heritage of Indigenous peoples, NWT's infrastructure, and the economy.

The Government of the Northwest Territories (GNWT) is taking action to mitigate and adapt to climate change in collaboration with Indigenous governments and organizations (IGOs), the Government of Canada, industry, non governmental organizations (NGOs), academia, and other partners.

The approach of our government to this commitment is highlighted in the **2030 NWT Climate Change Strategic Framework (CCSF)**, which outlines our long-term plan for addressing climate change and the **Mandate of the Government of the Northwest Territories (2019-2023)**.

The CCSF, released in May 2018, outlines a long-term vision towards a strong, healthy economy that is less dependent on fossil fuels, while simultaneously developing the knowledge, tools and measures needed to increase our resilience and adapt to the changing climate.

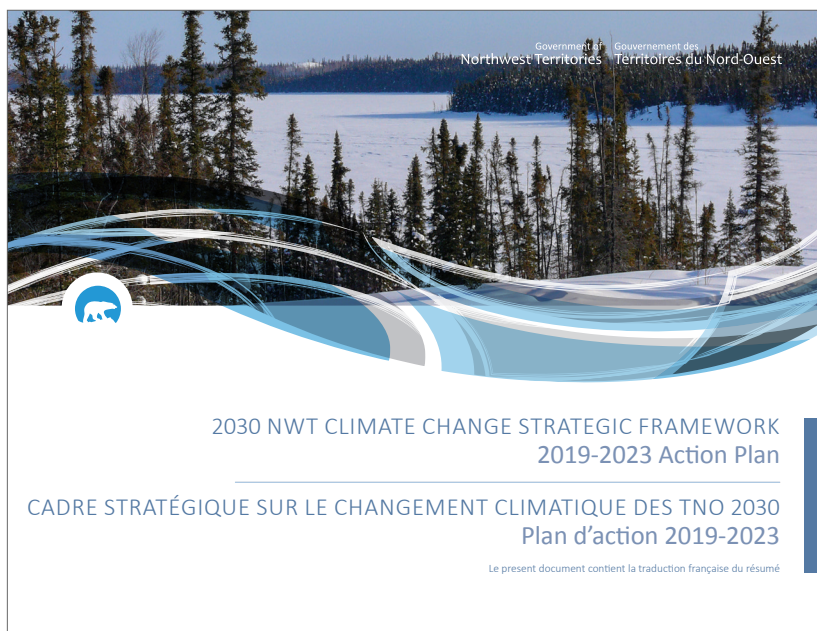
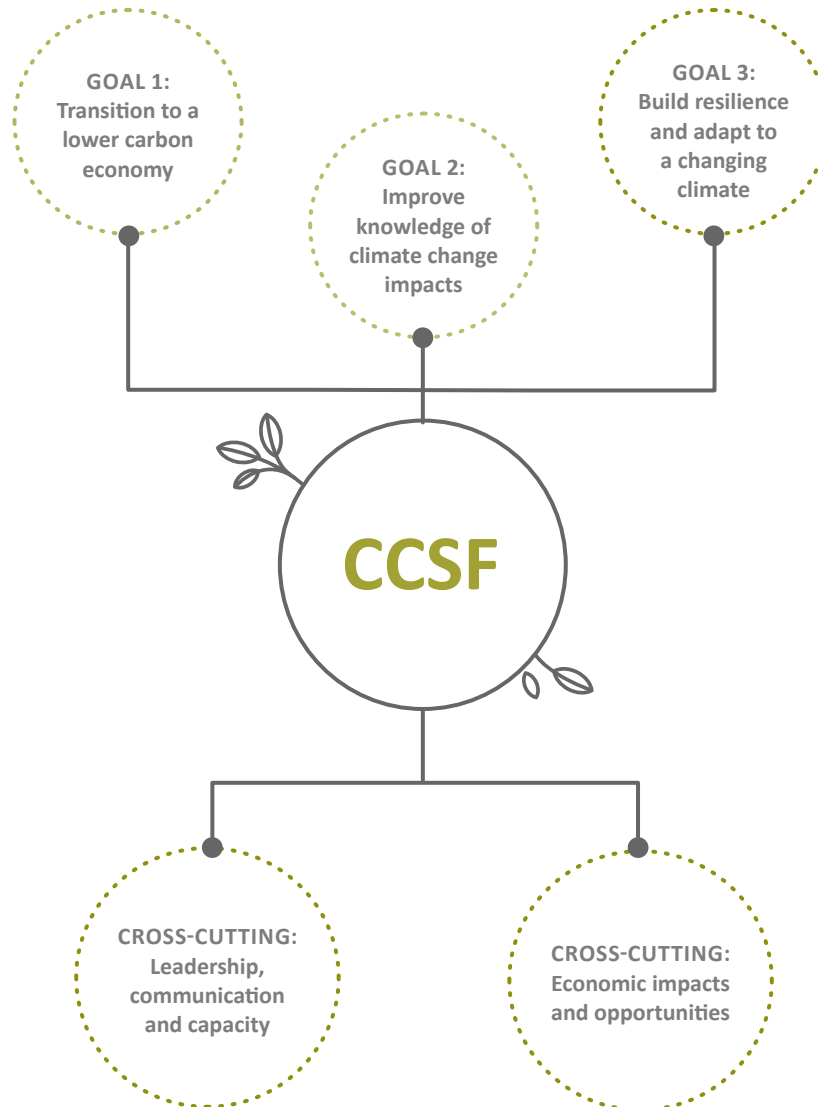


FIGURE 2. OVERVIEW OF GOALS AND CROSS-CUTTING THEMES IN THE CCSF



The *2030 NWT Climate Change Strategic Framework 2019-2023 Action Plan* (Climate Change Action Plan) was released in April 2019 and guides the implementation of the CCSF for the first five years. The Climate Change Action Plan presents a summary of action items and areas for future collaboration to address the three goals and two cross-cutting themes of the CCSF. This is not an exhaustive list of actions needed to respond to climate change in the NWT.



A barge cruises on the Mackenzie River, near Fort Good Hope

Purpose of the Annual Report

The Annual Report ensures public transparency and accountability by keeping residents informed about progress, partnerships, contributions, and key next steps supporting the implementation of the CCSF from April 1, 2020 through March 31, 2021. This is the second-annual report.

Part 1: Actions

Contains 104 action items that are resourced, and either underway or anticipated to begin within the 2019-2023 timeframe

Part 2: Areas for Future Collaboration

Identifies 28 critical and high priority action areas that require additional resources to be initiated

Implementation, Reporting and Measuring Progress

Outlines the steps needed to implement, report and measure progress on the Climate Change Action Plan

Each year, annual reporting reflects the progress made on Part 1 and 2 actions identified within the Climate Change Action Plan.

Progress in 2020-2021 for each action is documented in Appendix A.

Integrated Reporting – Linking the 2030 NWT Climate Change Strategic Framework, 2030 Energy Strategy and NWT Carbon Tax

Several GNWT initiatives guide the territory's approach to reducing emissions and transitioning to a lower-carbon economy:

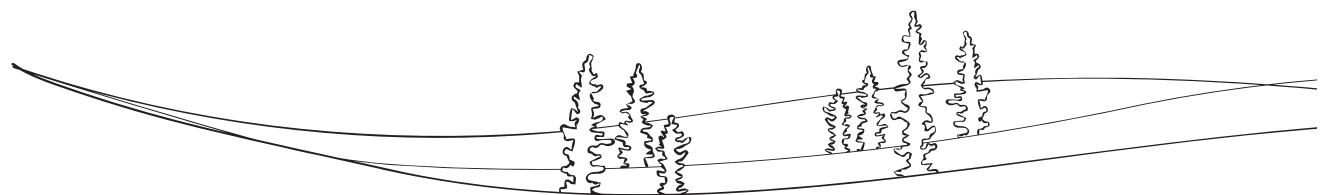
- 2030 NWT Climate Change Strategic Framework and Action Plan 2019-2023
- 2030 Energy Strategy and Energy Action Plan
- NWT Carbon Tax

Progress on the Climate Change Action Plan in 2020-2021 is summarized in Appendix A. Updates on the implementation of the 2030 Energy Strategy are detailed in the *NWT Energy Initiatives Report, 2020-2021*. Updates on NWT Carbon Tax implementation are reflected in the *NWT Carbon Tax Annual Report 2020-2021*.

Progress on all three initiatives is integrated and summarized in the Climate Change Plain Language Integrated Report 2020-2021.

In October 2017, the Office of the Auditor General (OAG) of Canada submitted its report, *Climate Change in the Northwest Territories*, to the GNWT.

The Report contained specific recommendations that have been incorporated in the CCSF. In the Climate Change Action Plan, action items that address OAG recommendations are noted. They are also highlighted in Appendix A of this report.



2.0 Investments

Significant investments have been made in implementing the 104 Action Items in Part 1 and the 28 Action Areas in Part 2 of the Climate Change Action Plan.

Significant investments have been made in implementing the 104 Action Items in Part 1 and the 28 Action Areas in Part 2 of the Climate Change Action Plan. These include funding for operational costs, as well as staff time. As the need to respond to climate change in the NWT continues to grow, additional staff and funding will be required to address these challenges. Resources continue

to be sought and leveraged from numerous partners, primarily from the federal government, to address climate change mitigation and adaptation across the NWT.

In fiscal year 2020-2021, approximately \$55.6 million in financial and human resources were invested by the GNWT to implement both Parts 1 and 2. This total includes funding that

has been provided by the federal and territorial governments to support both mitigation and adaptation. External partners have invested even more. In 2020-2021, the GNWT created 15 new positions across 5 departments which will allow for important progress on specific Part 2 Action Areas in the years to come.

Goal/Theme	Investments ²
Goal 1	\$38,197,980
Part 1	\$38,120,000
Part 2	\$77,980
Goal 2	\$7,637,183
Part 1	\$6,991,255
Part 2	\$645,928
Goal 3	\$8,892,499
Part 1	\$6,991,255
Part 2	\$645,928
Cross-Cutting Themes	\$840,606
Part 1	\$488,999
Part 2	\$351,607
TOTAL	\$55,568,268

² These amounts are approximate, as it is challenging to track all resources that are specifically spent on the implementation of the Action Plan

3.0 Challenges and Opportunities

This section summarizes the challenges and opportunities we faced in 2020-2021. Some challenges can only be resolved by planning many years in advance. Other challenges and opportunities, such as the global COVID-19 pandemic, were unexpected and required immediate action. We continue to study all challenges and opportunities we faced this year, work on solutions, and plan for the future.

COVID-19 PANDEMIC

Field work and community engagements were delayed, greatly reduced, or cancelled to reduce the potential for COVID-19 transmission. Many GNWT staff members were redeployed as a result of the GNWT's response to COVID-19. This may continue to challenge us as we move forward. While the COVID-19 pandemic continues to be a challenge, the residents of the NWT have proven their resiliency, adaptability and dedication to addressing the impacts of climate change, by finding opportunities to ensure work could continue, building on existing local capacity while meeting COVID-19 risk mitigation measures.

HIGHLY VARIABLE EMISSIONS

Annual greenhouse gas emissions in the NWT are highly variable. This variability of fuel use is heavily dependent on economic activity and weather. As industry's emissions represent approximately half of territorial emissions, the addition or subtraction of just one industrial development can have a significant impact on overall emissions. For example, a cold snap one winter can impact the amount of fuel combusted as communities may need to burn more fuel to heat homes and buildings. Both factors can substantially impact progress towards the NWT's emissions reduction targets.

SHARED RESPONSIBILITIES

Tackling climate change is a shared responsibility between many different parties – including the territorial and federal governments, IGOs, community governments, and co-management boards.

Coordination will always be a challenge as we move forward, but also offers important opportunities for relationship building and information sharing. To this end, the NWT Climate Change Council (The Council) was formed to provide input and guidance on focuses and priorities for our work.

This Council is a forum for information-sharing and collaboration with non-elected representatives from IGOs, NWT communities, and the GNWT. They will work with advisory panels and groups including Elders, youth, and stakeholders to find shared solutions to the challenges and opportunities we face.

CONTINUOUSLY CHANGING KNOWLEDGE AND NEED TO ADAPT

Climate change is an ongoing challenge – and even as the GNWT and its partners improve our collective understanding of climate, the climate continues to change. This makes it difficult to appropriately prioritize actions to make the most progress towards adaptation and mitigation. A real difference could be made by establishing a Northern Climate Hub – an initiative that the GNWT and partners across the North have requested the federal government to implement for some time. This would ensure region-specific information is available for Northern decision-makers, including territorial, Indigenous and community governments. With continued targeted, long-term efforts committed to by partners in NWT climate action, and appropriate support from the federal government, the NWT will be able to better predict future climate-related changes, build more resilience, and advance climate change adaptation in the territory.

4.0 Reporting Results

The Climate Change Action Plan includes actions to address the three goals and two cross-cutting themes of the CCSF.

Part one includes 104 resourced action items, and part two includes 28 high priority action areas that require additional resources to be completed.

Each action item and area contribute to broader outcomes.

For the purposes of reporting, actions have been designated as

“initiated,” “completed,” or “not yet initiated.”

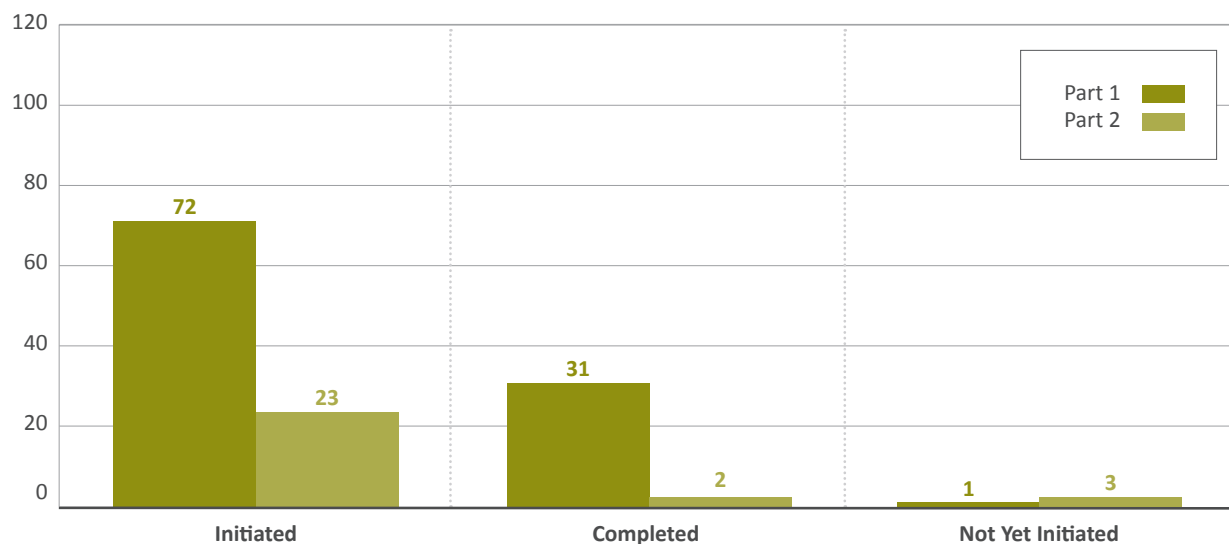
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- An action is considered “completed” if the final milestone(s) are met and

ongoing implementation continues

- An action is considered “not yet initiated” if work has not begun on that action

Below is a summary of implementation progress as of March 31, 2021, which builds on progress made in 2019-20.

FIGURE 3. OVERVIEW OF IMPLEMENTATION PROGRESS AS OF MARCH 31, 2021.



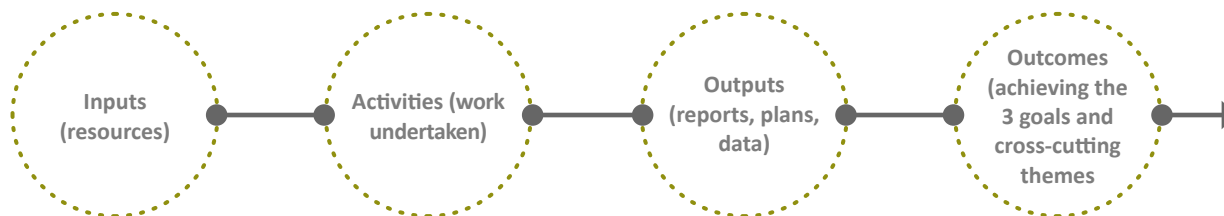
How We Are Monitoring Progress

To monitor the effectiveness of climate change-related actions, the GNWT follows a monitoring and evaluation framework which determines if our actions are achieving the goals and outcomes in the 2030 NWT Climate Change Strategic Framework.

The internal monitoring and evaluation framework of the Climate Change Action Plan allows the GNWT to track and demonstrate the effectiveness of the inputs and activities towards the GNWT led actions.

FIGURE 4. EXAMPLE OF A LOGIC MODEL.

A logic model illustrates the pathway from inputs (resources) to final outcomes. Inputs (resources like staff time and funding) allows for activities to occur (work undertaken). This work creates outputs (e.g., reports, data, plans) which will in turn lead to the final outcomes (achievement of the goals and cross cutting themes).



The internal monitoring and evaluation framework consists of a logic model and a performance measurement plan.

Performance Measurement Plan:

Identifies performance measures (also called indicators) for each of the GNWT led action items and areas. These measures describe the data that will be collected or the activities that will be undertaken to complete each action item and area.

GOAL 1: TRANSITION TO A LOWER CARBON ECONOMY

Collectively, the CCSF, 2030 Energy Strategy, the NWT carbon tax and their related action plans contribute to the goal of transitioning to a lower carbon economy. The actions of goal one complements the abovementioned strategies and legislated approaches to support the transition to a lower carbon economy, as well as a lower carbon lifestyle for the residents of the NWT.

The stated outcomes include:

- Reduction in GHG emissions
- Accurate reporting of GHG emissions
- Increased GNWT mitigation and adaptation coordination

In 2020-2021, progress highlights include:

- Invested \$38.0 million in energy projects in all NWT communities
- Reduced NWT GHG emissions by an additional 3.6 kilotonnes CO₂e
- Continued to develop projects improving NWT energy system’s reliability while stabilizing residents’ energy bills
- Continued to implement the NWT Carbon Tax
- Signed an agreement with NTPC to improve accuracy of utility data tracking

GOAL 2: IMPROVE KNOWLEDGE OF CLIMATE CHANGE IMPACTS

Goal two focuses on filling the knowledge gaps we know exist in our understanding of how climate change is impacting the NWT.

The stated outcomes for Goal two are:

- Baseline data and information linked to climate change has input from communities and Indigenous and local knowledge holders, where appropriate
- Baseline data or information on climate change is accessible
- Baseline data and/or information has been collected, processed, and assessed to allow the GNWT, partners, and the public to have improved knowledge of climate change impacts

To ensure efforts towards these outcomes produce the results necessary to effectively consider adaptations for climate related impacts the information and data should be:

- Informed by Indigenous knowledge, local knowledge, and western science
- Accessible to the public
- Designed to improve our overall understanding of climate change impacts

New research and monitoring initiatives are targeted to address known information and data gaps in climate change knowledge. These previously determined gaps are:

- the natural environment
- human health and well-being
- public safety
- infrastructure
- culture and heritage

Significant progress was made in 2020-2021.

In 2020-2021, progress highlights include:

- Continued community-based monitoring and research, involving youth, while ensuring compliance with COVID-19 restrictions
- Secured funding to support community government core needs, including infrastructure impacted by climate change
- Established mechanisms for climate change-related human health and public safety messaging
- Installed a permafrost ground temperature monitoring network along the Dempster and Inuvik Tuktoyaktuk highways
- Inspected infrastructure, including tracking for potential impacts of climate change
- Advanced mapping of four permafrost geohazard themes to inform community hazard maps, and completion and **publication of the Organic Terrain theme**
- Established the NWT Pests, Pathogens and Invasive Species Council
- Expanded monitoring of wildlife to further track ranges of native and non-native species was undertaken
- Initiated research to evaluate potential climate change impacts on snow accumulation in the NWT
- Partners completed several wetland inventory projects in protected areas
- Initiated/completed several vulnerability and risk assessments for wildlife, forests, protected areas, human health, cultural places, and infrastructure
- Responded to permafrost slumps and thaws, as they impacted infrastructure

GOAL 3: BUILD RESILIENCE AND ADAPT TO A CHANGING CLIMATE

Actions to achieve goal three build on the work initiated and completed under goal two. To build resilience and adapt to the NWT's changing climate, the GNWT and our partners must improve our knowledge of climate change impacts through research and monitoring.

Progress reporting is focused on four overarching areas:

- supporting ecosystem viability
- managing the natural environment and demands on it
- protecting and supporting people
- designing, building and maintaining resilient infrastructure

Results collected from the research and monitoring work outlined under goal two will be used to better manage and adapt to climate change related impacts. These impacts include those already occurring and those yet to come. Focused adaptation work is underway, but more work is needed to effectively adapt to current and future climate conditions.

Actions under goal three are divided into four themes:

1. Ensuring the viability and sustainability of ecosystems – which is critical to improve ecological, social, and economic resilience at the landscape level
2. Adjusting approaches and decision making processes in current monitoring and management plans by incorporating new information and indigenous knowledge – which will better acknowledge vulnerabilities and uncertainties related to anticipated and accelerating changes
3. Supporting the increase of community capacity and provision of relevant knowledge – which will allow various levels of government, as well as NWT residents, to anticipate, address and minimize risks and impacts from climate change

4. Developing specific Northern infrastructure standards and changing certain practices – which will ensure that assets and facilities are resilient in the face of future conditions in the North

The stated outcomes for goal three include:

- Increased coordination and accountability by the GNWT on adaptations to climate change impacts
- Adaptation to known and understood climate change impacts has been supported/initiated
- Baseline data or information on climate change is accessible

In 2020-2021, progress highlights include:

- Formed the Thaidene Nënë and Ts'udé Niljné Tuyeta protected areas management boards
- Continued the co-management and conservation of caribou in a changing climate
- Initiated development of an overall Climate Change Adaptation Strategy for Wildlife in the NWT
- Implemented community adaptation measures, including FireSmarting and Community Wildfire Protection Plans
- Supported increased production of local agriculture products on established and growing farms
- Supported on the land activities to promote food security
- Progressed on the construction of multiple all-season roads

CROSS-CUTTING THEMES: LEADERSHIP, COMMUNICATION AND CAPACITY-BUILDING AND ECONOMIC IMPACTS AND OPPORTUNITIES

The cross-cutting themes of leadership, communication, capacity-building, and economic impacts and opportunities are integral components to consider in the NWT's climate action.

Improved leadership, capacity, and communication will allow the territory to:

- better collaborate with all partners
- seize more opportunities for investments and expanded partnerships
- enable communities and residents to build resilience and adapt to climate-related changes
- increase participation and leadership in climate action across the territory

Ensuring economic opportunities and impacts are considered will help the territory realize:

- plan for the costs reaching lower emissions and adapting to changes in climate will have on local economies
- capitalize on long-term opportunities in traditional economies, recreation, and tourism for a greener, more diverse economy

The stated outcomes for the cross-cutting theme of leadership, communication and capacity-building include:

- increased coordination and

accountability by the GNWT on adaptations to climate change impacts

- adaptation to known and understood climate change impacts has been supported/initiated
- baseline data or information on climate change is accessible

In 2020-2021, progress highlights include:

- The NWT Climate Change Council was established, including members from IGOs, NWTAC, ENR and INF
- The GNWT funded 15 new climate change-focused positions and continued advocating for funds to support action on climate change
- The GNWT formally included climate change considerations in government decision-making instruments
- The GNWT continued to support to IGOs and communities to develop plans and strengthen their capacity to respond to climate change and partnered with NWTAC to recognize communities for their climate change efforts

- Youth led climate change communications
- MACA continued to provide training opportunities for communities
- Communities and IGOs increased their capacity for monitoring
- Economic impacts of climate change continued to be assessed

5.0 Looking Ahead

Progress on the Climate Change Action Plan will continue to be reported annually. Updates on activities under the Energy Strategy and NWT Carbon Tax will also be summarized within each respective annual report, and the CCSF, Energy Strategy, and NWT Carbon Tax will continue to be coordinated and reported on across government. In 2021-2022, a review will be initiated on the Energy Strategy and accompanying action plan, and it is anticipated the review will include lessons learned that will lead to new research and analysis.

The findings from an independent review and evaluation of the Climate Change Action Plan in 2024-2025, along with emerging issues, new technologies and new opportunities, will inform potential revisions to the CCSF and support the development of the 2025-2029 Action Plan.

Specific areas of focus for 2021-2022 are summarized below.

PANELS AND ADVISORY GROUPS OF THE CLIMATE CHANGE COUNCIL

In 2021-2022, ENR, with support from the NWT Climate Change Council, will work towards establishing new panels and advisory groups to inform and support the Council.

The panels will advance shared priorities, conduct detailed work on specific subjects, and promote an exchange of information to better inform the Council's work. The advisory groups will be composed of specific groups of people, including youth and Elders, and stakeholders to such as youth, Elders and stakeholders.

Existing panels include the NWT Cumulative Impact Monitoring and Water Stewardship panels, that support ENR-led steering committees. Yet to be established is a Sustainable Livelihoods Panel, and further panels that focus on mitigation, adaptation or research could be formed in the future.





Elders in Délı̄ne, NWT

COLLABORATING WITH COMMUNITIES TO ENHANCE RESEARCH AND MONITORING

During 2020-2021, IGOs were able to support some monitoring traditionally led by southern-based researchers. Continued and strengthened funding and resources to support training and increase the

capacity of IGOs and communities to be directly involved in climate change monitoring, research, mitigation and adaptation is critical and will continue to be pursued.

FEDERAL CLIMATE CHANGE INITIATIVES AND SUPPORT

The NWT has committed to the targets of the [Pan-Canadian Framework on Clean Growth and Climate Change](#).

In December 2020 the federal government released [A Healthy Environment and a Healthy Economy](#). Canada's strengthened climate plan outlines a desire to further reduce GHG emissions and build a stronger, cleaner, more resilient, inclusive economy, in addition to the creation of associated policy and legislation. The GNWT will participate in the development of new federal policies and ensure the territory is poised to make the most of new programs and investments available to the North and its residents.

The GNWT and the NWT Climate Change Council will engage in the development and implementation of key federal strategies and plans to ensure our voices are heard. For example, in March 2021, Canada initiated engagement with

provinces, territories and national IGOs to seek input into a new National Adaptation Strategy. The GNWT is also participating in the implementation of the Hydrogen Strategy released in December 2020 and will be hosting a workshop in the fall of 2021 to work with stakeholders to develop a common vision on the possible role for hydrogen in a lower carbon economy for the NWT.

The federal Budget 2021, released in April 2021, focuses on a green recovery as COVID-19 pandemic restrictions ease. Economic relief post-COVID will support the goals and priorities of national climate policy. The federal government has also announced a new national GHG emission reduction target to achieve rates that are 40 to 45% below 2005 levels by 2030, as well as reaching net zero GHG emissions by 2050. The GNWT will continue to monitor federal policy statements in respect to climate change and advocate for resources to support the Climate Change Action Plan.



Deploying research equipment around the North Arm of Great Slave Lake, Dinàgà Wek'èhodi, NWT

The federal government has rolled out a variety of climate change focused initiatives in 2020-2021, such as the announcement to further reduce GHG emissions, putting forward the, and the initiation of a National Adaptation Strategy. The GNWT and its partners will do their part to participate in these initiatives while still addressing the NWT's climate change priorities.

The GNWT will work with the federal government, IGOs, and community partners to ensure northern needs are considered, and further analysis of climate change risks, costs and opportunities are undertaken at the national and international levels.

Appendix A:

2020-2021 Summary of Progress by Action Areas and Items

Under Part 1, the Summary of Progress column directly links to the respective action item identified. Part 2 Action Areas include priorities which will be addressed if-and-when required resources are available. Under Part 2, the Summary of Progress column describe efforts that relate to that action area, however, identified priorities may not be initiated.

GOAL 1: TRANSITION TO A LOWER CARBON ECONOMY PART 1

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
1.1 Transitioning to a lower carbon economy	A. Implement the actions and initiatives outlined in the 2030 Energy Strategy: Energy Action Plan 2018-2021	INF, AEA, NTPC, NWTHC, Federal Departments, IGOs, Community Governments, Industry, NGOs	<p>In 2019 (the most recent year for which data is available), the NWT's total annual emissions were estimated at 1,377 kt CO₂e – a figure 16% lower than 2005 levels. In 2020-2021, the GNWT spent \$38.0M in energy-related investments to reduce GHG emissions, improve the NWT energy system, and stabilize resident's energy bills. Projects were delivered in all NWT communities and GNWT led efforts contributed to reducing territorial emissions by 3.6 kilotonnes of carbon dioxide equivalent.</p> <p>Detailed reporting on the implementation of the actions and initiatives outlined in the 2030 Energy Strategy: Energy Action Plan 2018-2021 is provided in the 2020-2021 Energy Initiatives Report.</p>	Initiated

³ This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
	B. Implement NWT carbon pricing	FIN	<p>On July 1, 2020, the carbon tax increased from \$20 per tonne of carbon dioxide equivalents to \$30 per tonne.</p> <p>Detailed reporting on the implementation of carbon pricing through the NWT Carbon Tax is provided in the 2020-2021 NWT Carbon Tax Report.</p>	Completed
1.2 Addressing climate change in environmental assessment and licensing/permitting of resource development and other projects	A. Collaborate on policy development, information requirements and tools to integrate climate change considerations	ENR, Regulatory Boards, ITI, Lands, Industry, NGOs	ENR led the development of a draft guideline to integrate climate change in environmental assessments in the Mackenzie Valley. The draft is under review by GNWT departments, and work will continue in 2021-2022. Although the guideline is not yet finalized, parts of it may be used to inform how the GNWT requests information from proponents with respect to integrating climate change into the environmental assessment process.	Initiated
	B. Include climate change considerations in GNWT submissions to regulatory boards	ENR, GNWT	GNWT departmental representatives attended the information session on the Pine Point Mine Project Environmental Assessment on March 12, 2021. The draft Terms of Reference for the Pine Point Project Environmental Assessment, once released in summer 2021, will be reviewed to ensure climate change considerations will be scoped into the environmental assessment for the project.	Initiated
1.3 Determining the potential value of natural carbon sinks	A. Undertake work to estimate carbon stored in NWT ecosystems	ENR, FIN, Academia, NRCan (CFS), NGOs	<p>Baseline data have been collected by academic researchers to estimate carbon in NWT protected areas. A draft scientific paper has been reviewed by project partners and academic colleagues. Though delayed due to COVID-19, the paper will be undergoing revisions in 2021-2022, to address comments from reviewers (see 2.8D for further details on the project).</p> <p>Once the paper is finalized and published, maps of forest inventory attributes will be determined, and the generic Carbon Budget Model will be used to determine carbon stock and flux for the Taiga Plains ecozone.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
1.4 Improving GHG emissions tracking and reporting	A. Improve GNWT emissions tracking	ENR, INF, FIN, ECCC	<p>ENR is required to report on the GHG emissions emitted by all GNWT departments and programs, outside of government-funded social programs (e.g., Senior Home Heating Subsidies). ENR finalized a memorandum of understanding (MOU) with NTPC to facilitate the transfer of data to ENR to improve GHG emissions tracking and calculations for GNWT corporate emissions. The MOU was signed in April 2021.</p> <p>ENR worked with FIN to identify and address utility/fuel data entry issues. The GNWT will continue to develop solutions for accurate tracking and reporting of emissions from the territorial government throughout 2021-2022.</p>	Initiated
	B. Refine GNWT and NWT reporting methods ⁴	ENR, INF, FIN, ECCC	<p>ECCC reports NWT's annual GHG emissions in the National Inventory Report. GNWT compared it against their calculations. It was found in March 2021 that NWT emissions calculated by ECCC for Canada's 2021 National Inventory Report do not align with GNWT-calculated emissions. Meetings with ECCC, Statistics Canada, FIN and ENR have been set in 2021-2022 to determine the cause of inconsistencies and work on ensuring future data used are consistent.</p> <p>ENR will continue to independently calculate NWT GHG emissions to validate ECCC's estimate, and work with federal and territorial departments to improve the accuracy of emissions reporting.</p>	Initiated

⁴ This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

PART 2

Further funding will be required to fully implement these Action Areas.

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>6.1 Determining the potential value of natural carbon sinks</p> <ul style="list-style-type: none"> Determine potential economic value of stored carbon in the ecosystem 	<p>ENR, FIN, Academia, NRCan (CFS), NGOs</p>	<p>Action Area 6.1 has not yet been initiated. ENR will continue to explore the opportunity for offsets and determine next steps with its partners.</p>	<p>Not yet initiated</p>
<p>6.2 Implement composting in small to medium-sized communities to reduce greenhouse gas emissions from community landfills</p> <ul style="list-style-type: none"> Undertake planning and feasibility work Provide support for projects 	<p>ENR, Community Governments</p>	<p>ENR began developing the NWT Compost Facility Standard and Guidelines in 2020-2021, as a first step to ensuring environmental safeguards are in place before it supports communities to develop sustainable compost facilities. Once the Standards are established, efforts will be made to seek and support three to five small- to medium-sized community composting projects with funding under the Waste Resource Management Strategy.</p>	<p>Initiated</p>

GOAL 2: IMPROVE KNOWLEDGE OF CLIMATE CHANGE IMPACTS PART 1

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.1 Supporting the GNWT Knowledge Agenda – climate change research	A. Leverage existing research programs to incorporate community-based participation through the development of community and academic partnerships ³	ENR, IGOs, Academia, Community Governments, NGOs	<p>Climate change is a cross-cutting theme in the Knowledge Agenda’s Action Plan and ENR supported 5 projects in 2020-2021 with a link to climate change. Support was provided by initiating community partnerships, providing funding, creating opportunities, etc.</p> <p>ENR provided support to the Arctic Research Foundation, to engage communities in research on Great Slave Lake on board the Nahidik research vessel. In partnership with Arctic Research Foundation, Northern Youth Leadership and Nature United, 15 students from 5 communities (Dettah, Łutselk’e, Fort Resolution, Hay River and Yellowknife) were given the opportunity to work with scientists, hydrographers, technologists, conservationists, and professional mariners for a week-long expedition which included discussions about climate change and its impacts on the lake.</p>	Initiated
	B. Support additional interdisciplinary research addressing economic, health, social and environmental change related to climate change	ENR, IGOs, Academia, Community Governments	<p>COVID-19-related restrictions limited the scheduled research in the NWT in 2020-2021. Some remote researchers, Indigenous governments and organizations, and communities engaged in field-based programs were able to apply for exemptions so that research could continue, though this was limited.</p> <p>To continue to support research and share their findings, a webinar series was initiated with NASA’s Terrestrial Ecology Program to share data and information about Arctic Boreal Vulnerability Experiment (ABoVE) with a broader range of stakeholders, such as GNWT staff, IGOs, co-management boards, NGOs, and federal and academic partners, to learn about other research and activities in the territory. Two webinars were delivered in 2020-2021 and the series is ongoing.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.1 Supporting the GNWT Knowledge Agenda – climate change research	C. Link traditional and local knowledge holders with researchers in discussions or research about climate change	ENR, IGOs, Academia, Community Governments	<p>ENR continued to work with two programs funded by the Networks of Centres of Excellence of Canada: ArcticNet and the Canadian Mountain Network, to direct and guide research with a climate change focus. These Networks link community-based knowledge systems (including Indigenous and local knowledge) with researchers and other partners, to identify and quantify climate change impacts.</p> <p>ArcticNet brings together partners to study the impacts of climate change in the Canadian North and includes Indigenous knowledge where appropriate; one project was underway in 2020-2021 in the Dehcho. The Canadian Mountain Network supports the resilience and health of Canada’s mountain peoples and places through research partnerships based on Indigenous and western ways of knowing; two projects were underway in 2020-2021 in the Sahtú:</p> <ul style="list-style-type: none"> • Renewing Indigenous Relationships in Conservation • The Shútagot’ine Cultural Landscape Project 	Initiated
	D. Work with other jurisdictions, industry and academia on climate change related research, development and best practices for public infrastructure	INF, Industry, Academia	<p>INF continued to work on Northern Transportation Adaptation Initiative (NTAI) Projects, funded by Transport Canada, to facilitate better and more integrated climate change adaptation measures in transportation planning. Further, INF continued to participate on the National Research Council National Codes Commission Standing Committee for Energy Conservation in Buildings, which is responsible for developing the National Energy Code of Canada and contributes to reducing energy and greenhouse gas emissions from buildings.</p> <p>INF was engaged in research projects with Carleton University, University of Manitoba, and University of Waterloo to study climate change related impacts on horizontal infrastructure design and construction, and with the University of Northern British Columbia on carbon capture in vertical infrastructure materials. This research will continue in 2021-2022.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.1 Supporting the GNWT Knowledge Agenda – climate change research	E. Collaborate with the Transportation Association of Canada and the Canadian Permafrost Association on climate change related initiatives	INF, ITI (NTGS), Academia	<p>INF actively participated in meetings with the Transportation Association of Canada including the Northern Infrastructure Climate Change Sub committee in 2020-2021. INF attended the Transportation Association Conference in 2020-2021, where the theme was “The Journey to Safer Roads: Emerging Solutions.”</p> <p>INF worked with ITI (NTGS) and academia, in collaboration with the Canadian Permafrost Association, to increase knowledge of climate change impacts on permafrost. INF and ITI (NTGS) also continued to explore the potential for remote sensing and other technology to allow for monitoring and analysis of settlement and movement of infrastructure due to permafrost thaw, building off progress from 2019-2020.</p>	Initiated
2.2 Supporting conservation network planning	A. Develop a renewed strategy for conservation network planning	ENR, Lands, EIA, IGOs, NGOs, Land Use Planning Boards	<p>To support the development of a renewed Healthy Land, Healthy People: GNWT Priorities for Advancement of Conservation Network Planning, ENR helped facilitate a “Public Consultation on Conservation” survey. The majority of respondents support a renewed conservation strategy and 21% selected “climate change research and monitoring” as a key priority in healthy protected area networks. ENR initiated work with researchers from Wilfrid Laurier University to develop and review a best practice analysis of how climate change is being integrated into protected area management planning. This work will continue in 2021-2022 and include interviews with IGOs to determine how climate change considerations can or should be incorporated into protected areas planning.</p> <p>High-level information about each of the three protected areas (Thaidene Nëné, Ts’udé Niljine Tuyeta, Dinàgà Wek’èhodi), including their characterization, climate trends and projections, and potential climate change vulnerabilities related to wildlife, wildfires, migratory birds, and socio-economic and cultural vulnerabilities, are being assessed to inform future management plans.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.3 Enhancing the use of traditional and local knowledge	A. Build climate change education into the Take A Kid Trapping and hunter education programs	ENR, IGOs, MACA, HSS	Work to integrate climate change into the Take A Kid Trapping program and hunter education programs did not advance in 2020-2021 due to COVID-19. Climate change will be included in program materials in 2021-2022.	Initiated
	B. Support the collection, analysis or synthesis of indigenous knowledge through the NWT Cumulative Impact Monitoring Program to better understand environmental trends and cumulative impacts for use in decision-making	ENR, IGOs, Community Governments, Co-management Boards, Academia	<p>In 2020-2021, NWT Cumulative Impact Monitoring Program funded four projects with an Indigenous knowledge focus. Two of these projects are complete, and their final reports are accessible on the NWT Discovery Portal by searching for their project numbers:</p> <ul style="list-style-type: none"> • Watching the land: Knowing the cumulative impacts of change (CIMP191) • Yellowknives Dene Cumulative Impact and Monitoring Framework (CIMP201) <p>There was 1 community presentation based on research with an Indigenous knowledge focus funded by NWT CIMP. NWT CIMP also released several NWT Discovery Portal bulletins in 2020-2021, all with a link to climate change.</p>	Initiated

⁶ These action items intend to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.4 Improving management and use of data / information ⁶	A. Inventory and evaluate NWT environmental data and data products to support climate change actions	ENR, ISSC, ITI (NTGS)	In 2020-2021, ENR participated in the Environment and Climate Change Canada Northern Climate Data Working Group, which is inventorying and documenting northern climate data (including historical climate data, climate station data, climate maps, and climate projections). The Working Group is summarizing datasets to provide a report with recommendations on data that are most appropriate for various northern applications. The work completed by ENR in 2019-2020 (evaluating NWT environmental data to support climate change) will inform the Northern Climate Data Working Group.	Initiated
	B. Develop and implement a central online resource to share climate change knowledge and information	ENR, ISSC	ENR continued to work on the development of a public facing central online portal for climate change knowledge and information. In 2020-2021, ISSC completed a Climate Change Portal Concept Document and began a business engagement document. ENR is partnering with the University of Victoria to develop a focused portal for NWT climate station data that is accessible to the public. NWT data will continue to be added in 2021-2022.	Initiated
	C. Improve dissemination of climate change results and products	ENR	ENR responded to requests to access climate change data and resources. Due to COVID-19, knowledge transfer activities (e.g. conference presentations, technical summaries) could not take place. As the central online portal continues to be developed in 2021-2022 (see 2.4B for further details), the dissemination of climate change results and products will also be considered.	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.5 Climate and weather	A. Evaluate monitoring network requirements, potential monitoring redundancies and prioritize monitoring gaps	ENR, ECCC (MSC)	<p>ENR supported a project to determine if ecoregions of the NWT are adequately represented by climate stations. This project will identify gaps to prioritize the location of new climate stations. Climate data collected by Canadian universities was obtained to help fill monitoring gaps.</p> <p>ENR continued to participate in the Canadian Council for Weather and Climate Monitoring.</p>	Initiated
	B. Continue, and develop options to enhance, climate monitoring at NWT monitoring sites	ENR, ECCC, PCA, Industry, Academia	<p>ENR participated in the Standards Council of Canada Working Group, working towards the development of standards for climate monitoring. When complete, these standards will ensure climate monitoring is consistent across Canada, such that data can be readily comparable to other Canadian jurisdictions. ENR planned a GNWT interdepartmental climate monitoring meeting, which took place in April 2021, and initiated work to develop a Climate Monitoring and Data Stewardship Plan. The GNWT funded two positions (Climate Scientist and Senior Climate Change Scientist) that will provide future capacity to coordinate and enhance climate monitoring. To enhance ENR climate monitoring, including new year-round operation of climate stations, two new telecommunications technician positions were also funded to maintain expanded climate monitoring.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.5 Climate and weather	C. Develop a plan for a northern climate hub to support delivery of climate services and products	ENR, ECCC (CCCS)	<p>The governments of the Northwest Territories, Nunavut and Yukon continued to work closely to advocate for a Northern Climate Services Hub. Numerous meetings with ECCC took place and progress was made on a potential hub structure and budget. The NWT's Minister of Environment and Natural Resources, the Honourable Shane Thompson, met with federal Minister of Environment and Climate Change, the Honourable Jonathan Wilkinson, as well as Yukon and Nunavut Ministers, to highlight the importance of the Hub and need for federal funding to establish a Hub.</p> <p>Unfortunately, no funding was allocated for a Hub in the 2021 Federal Budget announcement in April 2021. Work will continue in 2021-2022 to discuss options going forward to further support the delivery of climate services and products.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.5 Climate and weather	D. Develop climate projections and climate indices	ENR, ECCC, NRCan (CFS), Academia	<p>ENR continued to develop the Parameter-elevation Regressions on Independent Slopes Model (PRISM) climate mapping system in the NWT, which will be used to develop climate projections. The PRISM project will include climate data from all available climate stations in the NWT, resulting in maps of projected temperature and precipitation that will be publicly available. The maps will project current climate and can be used to indicate climate in areas without climate stations. This project is supported by the Climate Change Preparedness in the North program.</p> <p>ENR and partners including NWTAC provided input into community climate change profiles developed by ECCC's Canadian Centre for Climate Services in 2020-2021. The profiles (created for all 33 communities in the NWT) show some of the predicted climate-related changes communities can expect. The profiles include scientific models and examples of initial steps to be taken to adapt to these changes. They will be updated regularly.</p> <p>ENR provided input to ECCC climate products, including the Climate Atlas of Canada as well as input on community climate profiles for all NWT communities. The GNWT funded Climate Scientist and Senior Climate Change Scientist will provide future capacity to develop climate projections and indices.</p>	Initiated
	E. Continue to monitor rates and dynamics of coastal erosion along the Beaufort Sea	NRCan (GSC), Community Governments, Federal Departments, ECE (ARI)	<p>NRCan, in collaboration with the GNWT and with coastal communities, is leading monitoring of the rates and dynamics of coastal erosion along the Beaufort Sea. Data on landscape elevation, which is critical for flood modelling, was collected from an aerial survey flown over the community of Tuktoyaktuk. Five peer-reviewed publications were produced to highlight the state of the Arctic coasts at specific locations (Pullen Island, Crumbling Point, PCL-Peninsula Point and Tuktoyaktuk).</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.6 Permafrost	A. Collect existing ground temperature data along the Dempster and Inuvik-Tuktoyaktuk highways	ITI (NTGS), INF, NRCan (GSC)	<p>This action item was completed in 2020-2021 as the ground temperature monitoring network along the Dempster and Inuvik-Tuktoyaktuk (ITH) Highways has been established. Ground temperature data were collected at 120 monitoring sites and made publicly available by ITI (NTGS) as published to the References Database.</p> <p>Permafrost monitoring and collection of ground temperature data along the Dempster-ITH corridor is ongoing and will be captured under Action 7.3 in subsequent Climate Change Annual Reports as part of a permafrost monitoring network for key infrastructure corridors.</p>	Completed
	B. Develop a plan to undertake regional terrain sensitivity and geohazard mapping and monitoring	ITI (NTGS), ENR, ISSC, NRCan (GSC), Academia	<p>A plan to map permafrost geohazards is being implemented through the NWT Thermokarst Mapping Collective project (see Action Area 7.3 for further details). Protocols are being developed to map four permafrost geohazard themes: (1) Thawing slopes and mass wasting – protocol is in progress; (2) hydrological features – protocol is being reviewed; (3) Organic terrain – protocol is published as NWT Open Report 2020-010; and (4) Periglacial landforms – protocol is in progress. A synthesis of the four permafrost geohazard themes for NWT communities is also in progress. Finally, a protocol to map geohazards at fine scale has been published with collaborators at the Geological Survey of Canada (Geological Survey of Canada, Open File 8751).</p>	Initiated
	C. Compile ground temperature and geotechnical datasets for the NWT	ITI (NTGS), INF, ENR, NRCan (GSC), Academia	<p>This action item was completed in 2020-2021 as existing ground temperature and geotechnical datasets for the NWT have been compiled and published as NWT Open Reports on the References Database.</p>	Completed

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status										
2.6 Permafrost	C. Compile ground temperature and geotechnical datasets for the NWT	ITI (NTGS), INF, ENR, NRCan (GSC), Academia	<table border="1"> <thead> <tr> <th>TOPIC</th> <th>Reference Numbers</th> </tr> </thead> <tbody> <tr> <td>Permafrost ground temperature reports</td> <td>2017 008; 2019 007; 2019 014; 2019 016; 2019 017</td> </tr> <tr> <td>Permafrost geotechnical reports</td> <td>2019 009; 2019 010; 2019 011; 2019 012</td> </tr> <tr> <td>Permafrost ground temperature data synthesis</td> <td>2019 020</td> </tr> <tr> <td>Geotechnical data summary</td> <td>2020 006</td> </tr> </tbody> </table> <p>The data from these reports will be available through the NWT Permafrost Database, which is currently being developed.</p> <p>Ongoing and future activities concerning compilation of permafrost data will be captured under Action Area 7.3 in subsequent Climate Change Annual Reports.</p>	TOPIC	Reference Numbers	Permafrost ground temperature reports	2017 008; 2019 007; 2019 014; 2019 016; 2019 017	Permafrost geotechnical reports	2019 009; 2019 010; 2019 011; 2019 012	Permafrost ground temperature data synthesis	2019 020	Geotechnical data summary	2020 006	Completed
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Permafrost ground temperature data synthesis	2019 020													
Geotechnical data summary	2020 006													
D. Undertake community terrain mapping through a pilot study of two communities	ITI (NTGS), ENR, Academia	<p>Work has advanced to map permafrost geohazards for Tuktoyaktuk and Inuvik. Sensitive permafrost terrain has been mapped, in collaboration with the Geological Survey of Canada and modeling of the susceptibility of terrain to permafrost thaw is being refined.</p> <p>A new GNWT permafrost geohazard scientist position will further advance this work.</p>	Initiated											
F. Collaborate and advise on academic permafrost research in NWT	ITI (NTGS), Academia	<p>Collaborating with academia can significantly improve knowledge of permafrost in the NWT. All ITI (NTGS) research projects are collaborations or advisory partnerships. Collaborations with 12 universities are ongoing and ITI (NTGS) served as an advisory committee member for five graduate students in 2020-2021.</p>	Completed											

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.6 Permafrost	G. Work to increase human resource capacity to enable progress on permafrost-related actions	ITI (NTGS), INF, ENR, NRCan (GSC)	The GNWT secured funding in the fall of 2020 to grow the permafrost science team at ITI (NTGS) from one to four positions. A Permafrost Geohazard Scientist was staffed in late 2020-2021; a Permafrost Scientist (based in Inuvik) and a Geotechnical Data Scientist will be staffed in early 2021-2022.	Completed
2.7 Water and wetlands	A. Continue NWT water quality and water quantity monitoring which can contribute to the assessment of climate-related changes in quality and flow over time (including Community-Based Water Monitoring Programs)	ENR, ECCC, IGOs	<p>The GNWT maintains monitoring programs across the NWT to assess water quality and quantity. The information collected is critical to inform climate change knowledge, assessments and related decisions. Despite COVID-19, established water monitoring and research programs were able to be safely maintained in 2020-2021. Status and trend reporting were delayed, although annual reports were completed for the NWT Community Based Water Quality Monitoring Program and the Transboundary Water and Suspended Sediment results for the Alberta/NWT bilateral agreement.</p> <p>Engagement for water monitoring programs and initiatives with water partners was ongoing throughout the year, through various meetings. The need to consider climate-related changes was frequently discussed, particularly with Indigenous partners. Although these water and abiotic long-term monitoring programs are not designed specifically to address climate change, the information collected is critical to carry out any climate change assessments. Data for the NWT Community Based Water Quality Monitoring Program is on the Mackenzie DataStream. Other water quality datasets are managed in Lodestar Database and efforts are being made to post them to Mackenzie DataStream.</p> <p>In October of 2020, ENR released two videos promoting the Community-based Water Quality Monitoring Program. The videos provide an overview of the program and step-by-step instructions on how to take a water sample. These are valuable resources for communities looking to get more involved in research and monitoring that can inform knowledge of climate change.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.7 Water and wetlands	B. Continue to support the snow survey network to contribute to a better understanding of climate-related change in winter precipitation	ENR	<p>Despite COVID-19, snow surveys and other baseline programs were able to be safely carried out across the territory in 2020-2021.</p> <p>An annual spring bulletin is published online and distributed to various government agencies and industry to summarize results and inform them of anticipated freshet conditions. The NWT Snow Survey Bulletin & Spring Water Levels Outlook report was developed in spring 2021 and published in April 2021.</p>	Initiated
	C. Undertake NWT Wetland Inventory Mapping	Ducks Unlimited Canada, IGOs	<p>Several wetland inventory projects were completed in 2020-2021 by Ducks Unlimited Canada in the NWT in Thaidene Nënë, Dinàgà Wek'èhodi, and Ts'udé Niljné Tuyeta areas as well as the Whooping Crane Habitat Extension Inventory, which extends mapping efforts north of Wood Buffalo National Park. The results are being used for habitat modelling, assessing climate change alterations to waterfowl habitat, and other conservation efforts. Updated inventories will be showcased within the Canadian Wetland Inventory status viewer.</p> <p>These results have been published in a scientific journal (Merchant et al. 2020. High-latitude wetland mapping using multi-date and multi-sensor Earth observation data: a case study in the Northwest Territories) and presented at several scientific conferences. More mapping is planned for future years.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.7 Water and wetlands	D. Assess cumulative impacts to water, including climate change, as reflected in the NWT Cumulative Impact Monitoring Program (NWT CIMP) Water Blueprint	ENR, Academia, ECCO, IGOs, Community Governments	<p>In 2020-2021, NWT CIMP funded 13 projects with a water focus. Two of these projects are complete, and their final reports are accessible on the NWT Discovery Portal by searching by their project numbers:</p> <ul style="list-style-type: none"> An integrated monitoring program for a boreal forest watershed with discontinuous permafrost responding to climate warming and increasing anthropogenic pressures (CIMP199) Changes in Water Within the Mackenzie Delta/Beaufort Region as Indicators of Aquatic Health (CIMP200) <p>There were 16 community presentations, 5 scientific presentations, and 1 peer reviewed publication produced from research with a water focus funded by NWT CIMP.</p> <p>NWT CIMP also released several NWT Environmental Research Bulletins in 2020 2021, all with a link to climate change.</p>	Initiated
2.8 Forests and vegetation	A. Monitor changes to forest growth, productivity, health and regeneration after natural and human-caused disturbances in the context of the changing climate	ENR, NRCan (CFS), Academia	<p>A project is underway which is aiming to better understand forest regeneration post-fire, especially in the light of a changing climate. One project that has been initiated is a post-fire regeneration stand inventory in the 1995 Horn Plateau burned area located in Edézhíe Protected Area. An analysis of the data and report compilation is in progress.</p> <p>A separate monitoring program samples tree volume. A volume sampling program to capture a variety of stand ages was carried out in the South Slave region in the Buffalo River area in August 2020, though sampling was reduced and delayed due to COVID-19. Approximately 97 plots were measured. All plot measurements are planned to be completed in 2022.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.8 Forests and vegetation	B. Conduct vulnerability assessments for forest landscape areas of interest	ENR, NRCan (CFS)	ENR is in the process of conducting vulnerability assessments for forest landscape areas of interest, in three stages. An NWT Forest Baseline Report (Stage 1) is complete and will be published by late fall 2021. Stage 2 was initiated in 2020-2021 through a workshop; a summary report was completed, and an online mapping tool will be available in the summer of 2021. Stage 3 of the vulnerability assessment (to be initiated in 2021-2022) will include engaging IGOs to discuss knowledge sharing and development of adaptation strategies.	Initiated
	C. Improve understanding of changing wildfire regimes	ENR, NRCan (CFS), Academia	The project was delayed by COVID-19 in 2020-2021. In 2021-2022, the proposed approach will be reassessed to measure frequency, location, and size of wildfire occurrences over the last 200 years, to document changes over time. A report will be written after the data has been evaluated and will be made publicly available.	Initiated
	D. Produce baseline NWT-wide vegetation classifications	ENR, ISSC, NRCan (CFS)	Over 20,000 photos were acquired in 2020 to be used as calibration data for a Landsat-based vegetation classification. ENR planned for fieldwork in summer 2021 with the Canadian Forest Service. The classification will use airborne LiDAR and ground plot data to create additional data layers for forested classes, including height, age, density, biomass, and volume. This land-cover classification will enable change detection and comparison with 2010 data, allowing for improved assessment of climate-related changes at a landscape scale. This project is supported by the Climate Change Preparedness in the North program.	Initiated
	E. Complete forest health surveys and reporting	ENR, NRCan (CFS)	The annual forest health surveys were conducted in July 2020. Due to COVID-19, aerial data were only collected in the South Slave and the Dehcho areas.	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.9 Wildlife	A. Conduct wildlife climate change vulnerability assessments ⁷	ENR, IGOs, Co-Management Boards, ECCC, Academia	<p>A vulnerability assessment, which was initiated last year, has been completed for NWT species at risk. This assessment includes all species at risk, designated through either the NWT or federal Species at Risk Act and describes the factors contributing to species vulnerability and provides guidance for application of results to future management decisions. Vulnerability assessments will continue and take a phased approach for the inclusion of additional wildlife species, including keystone species, harvested species, and species of cultural and spiritual significance.</p> <p>Climate change recommendations are included in species status assessments (completed by the NWT Species at Risk Committee) and in NWT management plans and recovery strategies for species at risk (completed by the Conference of Management Authorities).</p> <p>As of March 2021, 21 species have been assessed, and 10 species at risk have NWT management plans or recovery strategies in place. These documents are available online.</p>	Completed
	B. Continue monitoring invasive and non-indigenous species and assess impacts from range shifts on wildlife	ENR, HSS, Co-management Boards, IGOs, ECCC, Academia	<p>A list of alien species present in the NWT was updated and is due to be published in 2021-2022. Monitoring of invasive and alien species was undertaken to continue to assess impacts from shifts in the ranges of wildlife, including: the NWT bat monitoring program; the NWT small mammal survey; forest pest monitoring flights; and wild pig surveillance flights. An NWT Wild Pig Surveillance and Response Plan was produced for the GNWT by the University of Saskatchewan. The NWT Wild Pig Surveillance and Response Plan will be released in 2021-2022.</p> <p>A summary report of Bartonella species (a bacteria) in NWT rodents was produced by the University of Saskatchewan. ENR will engage with HSS Public Health on the results of Bartonella species in NWT rodents prior to public release of information.</p>	Completed

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.9 Wildlife			ENR shared information with the public in 2020-2021 on diseases and other health impacts on wildlife.	
	C. Establish the NWT Council on Invasive Species, Pests and Pathogens (NWT CISPP)	ENR, NWT CISPP, IGOs, Co-management Boards	<p>The NWT Council on Invasive Species, Pests and Pathogens was incorporated under the NWT Societies Act on February 8, 2021. The initial meeting of the interim board of directors took place on March 11, 2021.</p> <p>Membership includes representatives from organizations that have authority for the management of biodiversity, land, and/or water in the NWT, as well as any members of organizations, companies, academia, or the public-at-large that have an interest in invasive species, pests, and/or pathogens. The terms of reference, bylaws, and policies are available online.</p> <p>The Council will endeavor to support rapid response programs and inform educational materials on future pests, pathogens and invasive species issues due to climate change. This action item is complete, although work through this council will remain ongoing.</p>	Completed
	D. Utilize the NWT Council on Invasive Species, Pests and Pathogens to support rapid response programs and educational materials on future pests, pathogens and invasive species issues due to the changing climate	ENR, NWT CISPP	Following the establishment of the NWT Council on Invasive Species, Pests and Pathogens in February 2021, a website , logo, branding, and communications templates for the Council were developed and launched. The website will continue to be updated and will host educational resources beginning in 2021-2022.	Initiated

⁷ This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.9 Wildlife	E. Disseminate current and new information on the health and distribution of wildlife, including diseases and parasites	ENR	<p>ENR shared information with the public in 2020-2021 on diseases and other health impacts on wildlife in the NWT through:</p> <ul style="list-style-type: none"> Rabies clinics delivered in the winter of 2020 and the spring of 2021, and pamphlets on rabies were distributed to the public at various events. It is thought that alterations to the landscape and distribution of wildlife associated with climate change may influence rabies ecology in the North. Radio interviews were conducted on concerns related to COVID-19 and zoonotic diseases in wildlife in November of 2020 with ENR's Wildlife Veterinarian (CBC Trailbreaker) and on rabies in the Beaufort Delta in January of 2021 (CBC Northwind). A section on wildlife health is being drafted for the State of the Environment Report, to be published in 2022. This included an overview of wildlife health, disease and potential risks to people and domestic livestock, and a section on contaminants in wildlife. 	Completed
	F. Continue using remote sensing techniques to assess wildlife habitat and impacts due to climate change	ENR, ECCC (CWS)	<p>An ongoing project (beginning in 2019-2020) led by a researcher from Queens University (funded through NWT CIMP) is assessing habitat changes on the Bathurst caribou range using historic and current satellite imagery to identify hotspots of change. On-the-ground assessment of vegetation is ongoing. An interim report was produced in 2020-2021.</p> <p>Climate data from NASA is being used in a cumulative effects assessment on the ranges of Cape Bathurst, Tuktoyaktuk Peninsula, Bluenose West and Bluenose East barren-ground caribou herds. The data allows the examination of trends in climate variables and how they might be related to caribou population dynamics.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.9 Wildlife	G. Enhance the knowledge of species presence, distribution and status to determine future needs based on a changing climate	ENR, Co-management Boards, IGOs, ECCC, DFO	Every 5 years, a report on the general status ranks of wild species in the NWT is published. The 5th report, NWT species 2021-2025, is planned for publication in late 2021/early 2022. In 2020-2021, all species lists and ranks proposed for inclusion in the report were approved by partners, including territorial and federal agencies and co-management boards, and drafting of the report is ongoing. These lists are used to systematically track new species in the NWT and to quickly rank the biological status of each of these species (approximately 30,000 in the NWT). The number of taxonomic groups included in the report is increasing which is indicative of our increased knowledge of biodiversity in the NWT. Monitoring the status ranks of species is important to detect changes before their status becomes critical and to determine which species need a more detailed assessment of their status or closer monitoring. Increasing the number of taxonomic groups included will enable the tracking of future species arrivals due to a changing climate. All updated ranks, species lists, and information used to derive the biological ranks are available on the NWT Species Infobase . Additionally, a field guide on NWT Amphibians and Reptiles was published in April 2021.	Initiated
	H. Assess cumulative impacts to caribou, including from climate change, as reflected in the NWT Cumulative Impact Monitoring Program Caribou Blueprint	ENR, Academia, IGOs, Community Governments	In 2020-2021, NWT CIMP funded 7 projects with a focus on caribou. Two of these projects are complete, and their final reports are accessible on the NWT Discovery Portal by searching by their project numbers: <ul style="list-style-type: none"> • Data and knowledge integration for improved monitoring of cumulative impacts of mining development and climate change on the Bathurst caribou (CIMP 141) • Assessing the disturbance responses of barren-ground caribou to industrial infrastructure (CIMP208) 	Completed

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.9 Wildlife			<p>There were 2 community presentations, 5 scientific presentations, and 1 peer reviewed publication produced from research with a caribou focus funded by NWT CIMP.</p> <p>NWT CIMP also released several NWT Environmental Research Bulletins on caribou in 2020-2021, all with a link to climate change.</p>	
2.10 Fish and marine mammals	A. Continue to improve baseline monitoring of species health and distribution with an emphasis on priority species of marine, anadromous and freshwater fishes, and marine mammals	DFO, ECCC, NRCan, IGOs, Co-management Boards	<p>DFO continued monitoring and baseline data collection in the NWT; although field work was impacted due to COVID-19, communities were able to help beluga monitoring continue. The Joint Secretariat - Inuvialuit Settlement Region hosts the longest-running beluga whale research program in the world, in collaboration with DFO and academia. Inuvialuit hunters have long supported research scientists for beluga research. In a normal year, local Hunters and Trappers Committees hire and train beluga monitors from communities, with support from DFO. These monitors work with community hunters to collect samples, and the information they collect is used by researchers to evaluate population parameters (which are important to consider in a changing climate). Thanks to this established relationship, data collection by Inuvialuit hunters was able to continue during COVID-19.</p> <p>In addition, research on arctic char and inconnu, two culturally important subsistence fish species, was published in scientific journals.</p> <p>DFO reports on baseline conditions and trends in key Arctic Ocean ecosystem variables in the State of the Arctic Ocean report series. The first report on the state of marine ecosystems in the Canadian Arctic was released in April 2020. The report includes a plain language public report and a technical report. Following this initial report, a report on the state of the Arctic Ocean will be released every four years.</p>	Completed

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.10 Fish and marine mammals	B. Continue monitoring temperature-dependent contaminants in subsistence species	DFO, ECCC, IGOs, Health Canada (guidelines)	The Arctic Monitoring and Assessment Programme (AMAP) has produced scientific assessments of mercury in the Arctic since 1998. The latest assessment (AMAP Assessment 2021: Mercury in the Arctic) was developed in 2020-2021 and published in July 2021. It builds from the 2011 AMAP assessment that focused solely on mercury, and provides information presented in recent AMAP assessments of contaminant effects on Arctic wildlife. Further, the assessment includes the latest information on mercury and human health in the Arctic. It was found that warmer temperatures may enhance methylmercury production in thawed permafrost and nearshore marine or lake sediments.	Completed
	C. Continue to monitor impacts of diseases and parasites on species	DFO, Health Canada, IGOs	DFO continues to monitor impacts of diseases and parasites on species. The first report on the state of marine ecosystems in the Canadian Arctic was released in April 2020. The report includes a case study on collaboration with ISR communities to determine indicators for disease identification in beluga.	Completed
	D. Assess cumulative impacts to fish, including climate change, as reflected in the NWT Cumulative Impact Monitoring Program Fish Blueprint	ENR, Academia, DFO, IGOs, Community Governments	<p>In 2020-2021, NWT CIMP funded 5 projects with a focus on fish. One of these projects is complete, and the final report is accessible on the NWT Discovery Portal by searching the project number:</p> <ul style="list-style-type: none"> Ecological monitoring of lake trout in Great Slave Lake (CIMP206). <p>There were 10 community presentations, 11 scientific presentations, and 4 peer reviewed publication produced from research with a fish focus funded by NWT CIMP.</p> <p>NWT CIMP also released several NWT Environmental Research Bulletins on fish in 2020 2021, all with a link to climate change.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.11 Human health and well-being	A. Communicate alerts and develop advisories related to extreme weather, natural disasters impacting health, zoonotic diseases and poor outdoor air quality	HSS, ENR, MACA	<p>Three boil water advisories were issued in 2020-2021, for Hay River, K'atl'odeeche First Nation, Enterprise and Kakisa based on increased turbidity in source water due to spring break-up. While these cannot be declared a direct outcome of climate change, it is expected that with changing water levels and increases in extreme weather events, boil water advisories may increase.</p> <p>In November 2020, ENR advised the public of higher-than-normal water levels and flow rates on lakes, rivers and streams across the NWT, including Taltson River, which experienced unprecedented flooding. ENR assisted individuals who lost assets due to flooding in the Taltson area in 2020-2021.</p> <p>The 2020 fire season required no alerts, however, the need for air quality and fire related alerts and advisories is also expected to increase as our climate continues to change. HSS completed a Standard Operating Procedure for the release of air quality advisories. Please see Action Item 2.9E for information on advisories related to zoonotic diseases.</p>	Completed
2.12 Public safety	A. Ensure residents, first responders, communities and the GNWT are better prepared to deal with the impacts of climate-related hazards	MACA, Community Governments, IGOs, NWTAC, PSC, NRCan (GSC)	<p>The territorial Emergency Management Organization's (EMO) Public Awareness Campaign did not occur in 2020-2021 because of COVID-19. However, the objectives of this action were still met through additional communication with communities related to the pandemic as well as daily contact with communities during flood and fire season. There were weekly media briefs because of the pandemic, and as appropriate these included messaging about floods and flood response. The Public Awareness Campaign will resume again in 2021-2022.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.12 Public safety	B. Update community emergency plans and incorporate methods for identifying and monitoring climate change related hazards and adapting to the increase in frequency and severity of such hazards	MACA, Community Governments, IGOs, GNWT	Although MACA did work with communities to update their emergency response plans in 2020-2021, the focus was on adding pandemic-specific sections.	Initiated
2.13 Culture and heritage	A. Continue research to assess impacts to heritage resources from climate-driven landscape disturbances	ECE, IGOs	ECE is continuing research projects, focusing on coastal erosion in Kugmallit Bay, alpine ice patches, and caribou fences. Several new coastal erosion risk assessments have been created, using the Long-Term Change Detection product and high-resolution satellite imagery. Further, a project was initiated to create an archaeological potential model for alpine ice patch archaeological sites in the Mackenzie Mountains (See 7.9 for more details)	Completed
2.14 Public and community infrastructure	A. Complete community infrastructure risk assessments and high-level adaptation options	MACA, ENR, NWTAC, Community Governments, IGOs	MACA led a high-level climate change vulnerability assessment of impacts on public and community infrastructure within the boundaries of the 33 communities of the NWT. Risk maps were provided for every community to illustrate the spatial extent of hazards and the locations of infrastructure at risk, as well as a list of medium/high risks identified, proposed adaptation measures (including maintenance and inspection procedures), and recommendations for future work to address identified data gaps. The findings of this assessment will support communities in making informed decisions about their existing and future infrastructure. The report was finalized in 2020-2021 and will be shared with communities and the public in 2021-2022.	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.14 Public and community infrastructure	B. Seek funding to fill community infrastructure gaps	MACA, INF Canada, NWTAC, Community Governments, IGOs	MACA supports community governments as they continue to plan their infrastructure priorities through the capital planning process, as well as with project implementation and applications for funding. Community governments continued to develop land use plans and strategic plans that consider climate-related risks and priorities, which influence the priorities that are represented on community government capital plans. In 2020-2021, the GNWT approved \$2.594 million in Community Government Funding to support the reduction in the funding gap to meet municipal core needs. Though, this is not a requirement, it is anticipated that some of this funding will be put towards infrastructure impacted by climate change. The federal Investing in Canada Infrastructure Fund for community governments continues to target community roads and solid waste sites.	Completed
	C. Improve documentation of GNWT infrastructure stability via more rigorous asset management activities on both vertical (i.e. buildings) and horizontal (i.e. highways and runways) infrastructure	INF	<p>Inspections and management of snowload and foundation systems are scheduled and tracked by INF's maintenance management software, which also produces quarterly reports. Building maintenance inspections also account for climate change impacts associated with movement and resulting signs of stress in buildings. This information is used to inform supplemental maintenance activities.</p> <p>In 2020-2021, annual inspections and reports were produced for INF's Highway Surface Management and Bridge Management Systems. Inspections were conducted at airports in accordance with the Airport Pavement Management System, producing reports that inform maintenance and project planning. All these internal reports track potential impacts of climate change and inform resulting infrastructure management decisions.</p>	Completed

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.14 Public and community infrastructure	D. Update climate change risk assessments for both vertical and horizontal GNWT infrastructure ⁸	INF	In 2020-2021, a geotechnical and structural assessment of GNWT and municipal buildings on specific foundation types that could be affected by permafrost thaw was completed to inform maintenance and future planning. Risk assessments are conducted during the design phase for all major projects, including climate change risk components, with an outlook over the life of the asset (e.g., building, road, runway). In 2020-2021, four major infrastructure transportation projects were underway, each with an associated formal climate change risk assessment. INF also continued to conduct asset inspections across NWT infrastructure for safety and regulatory compliance as part of standard asset management, including inspections of buildings, runways, roads, highways, culverts, and bridges. These inspections capture effects associated with climate change.	Initiated
	E. Collect and analyze ground temperature data to support the general knowledge base for GNWT infrastructure planning, design, construction and climate change impact monitoring ⁹	INF	Data from INF's extensive network of thermistors in highway infrastructure (including Highways 1, 3, 4 and the Inuvik-Tuktoyaktuk Highway) and building foundation systems was collected and analyzed, included in annual internal database reports, and used to inform ongoing asset maintenance and management. Upgrades to the thermistor network hardware are ongoing to maximize data coverage. While this monitoring and the resulting reports are used to manage infrastructure, they are inherently tracking the effects of climate change.	Completed

⁸ This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

⁹ This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
2.14 Public and community infrastructure	F. Continue to explore the potential for remote sensing and other technology to acquire data to allow monitoring and analysis of settlement and movement of GNWT infrastructure ¹⁰	INF, ISSC	Continuing to build on the remote sensing and other technology put in place in 2019-2020, satellite information was obtained in 2020-2021 and continues to be processed for select infrastructure, including select tanks farms, highways (Dempster & Inuvik-Tuktoyaktuk), and airports (Inuvik, Norman Wells, Yellowknife, Hay River) to monitor vertical displacement. This technology is an additional tool to help with early identification of impacts to infrastructure and to enable proactive maintenance, in response to climate change impacts. Development and expansion of the work is ongoing.	Completed

PART 2

Further funding will be required to fully implement these Action Areas.

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
7.1 Enhancing the use of traditional and local knowledge <ul style="list-style-type: none"> Document, use and transfer climate change related knowledge as prioritized by Indigenous governments to support decision-making pertaining to action areas 	IGOs, GNWT, NGOs	<p>Due to COVID-19, limited progress was made on several actions which would involve meetings with community members and field work.</p> <p>The Elders and youth advisory groups (which will be established as part of the NWT Climate Change Council) will inform work/priorities to support this action.</p>	Initiated
7.2 Climate and weather <ul style="list-style-type: none"> Undertake further climate modeling to predict future landscape change Implement a Northern Climate Services Hub 	ENR, ECCC, Academia, NRCan (CFS)	<p>Action Area 7.2 has not yet been initiated. Climate modelling is linked to new climate scientist positions that have not yet been staffed. The Northern Climate Services Hub has not yet been established.</p> <p>ENR is working with ECCC to staff a temporary position to deliver some of the functions envisioned for the Hub in the interim, and as the National Adaptation Strategy is developed.</p>	Not yet initiated

¹⁰ This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>7.3 Permafrost</p> <ul style="list-style-type: none"> Establish a permafrost monitoring network for the NWT Establish a permafrost data management system Analyze collected ground temperature data Assess sensitive permafrost terrain and inventory permafrost-related geohazards Interpret future permafrost behaviour across natural and built environments 	<p>ITI (NTGS), Lands, ENR, INF, ECE, Federal Departments, Regulatory Boards, Industry, IGOs, Community Governments, NRCAN (GSC, CCMEO), Academia</p>	<p>Spearheaded by the NTGS in 2019, the Thermokarst Mapping Collective brings together permafrost experts from a number of organizations to collaboratively develop methodology and map thaw sensitive terrain in the NWT. The objective of the NWT Thermokarst Mapping Collective is to generate NWT-wide thermokarst and permafrost feature inventory maps. In 2020-2021, five part-time mappers from across Canada were hired and trained to map four permafrost geohazard themes. This project is supported by the Climate Change Preparedness in the North program.</p>	Initiated
<p>7.4 Water and wetlands</p> <ul style="list-style-type: none"> Review monitoring networks to assess appropriateness for determining trends and/or impacts related to climate change Prioritize and enhance water monitoring networks to improve assessments of climate change impacts Undertake climate change vulnerability assessments on priority surface waterbodies to inform management decisions Identify and assess use of innovative technology for the remote assessment of water, snow pack and ice to assess changes including those related to a changing climate 	<p>ENR, ECCC, ISSC, NRCAN (CCMEO), IGOs</p>	<p>ENR partnered with the University of Waterloo to use ENR's snow survey measurements to compare with satellite data. This comparison will help assess if the data from these satellites can be used as a real-time operational product, or as a tool to evaluate potential climate change impacts on snow accumulation in the NWT. This is an example of research that could lead to valuable data on snow accumulation and can inform planning for communities at risk of spring floods. This analysis will continue in 2021-2022.</p>	Initiated
<p>7.5 Forests and vegetation</p> <ul style="list-style-type: none"> Explore the use of remote sensing tools for inventory and update of vegetation cover Produce baseline NWT-wide vegetation classifications for remaining regions Update baseline vegetation land cover inventory (2001-2010 base) for fires, land use and other climate-related changes 	<p>ENR, NRCAN (CFS), Academia</p>	<p>ENR initiated a project in 2019-2020, to improve our understanding of changes in forested landscape in the zone of discontinuous permafrost by building an aerial photo library across the NWT of landscape change features. The tasseled cap product, which is a remote sensing tool, is used to detect changes in brightness, greenness and wetness in satellite images. It has been successfully used to identify and map terrain features in treeless landscape. Fieldwork was delayed in 2020-2021 due to COVID-19. Fieldwork, data analysis, and reporting are ongoing. This project is supported by the Climate Change Preparedness in the North program.</p>	Initiated

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>7.6 Wildlife</p> <ul style="list-style-type: none"> Assess indirect effects of climate change (such as parasites, diseases and pathogens) on species at risk Conduct monitoring, including community-based monitoring, to track species as they extend their ranges and become established in the NWT and assess resulting long-term impacts Develop surveillance systems to support predictions of species distribution changes Enhance monitoring of invasive and non-indigenous species for ongoing assessment of impacts from range shifts on wildlife 	<p>ENR, ECCC, Co-management Boards, IGOs</p>	<p>ENR provided funding to expand muskox surveys in March 2021 into the northern Sahtú Region to understand trends and distribution of mainland muskox in relation to a changing climate. Understanding population numbers now and in the future will inform food security as muskoxen may be an alternative food source to caribou.</p> <p>ENR collaborated with the Sahtú Renewable Resources Board, Gwich'in Renewable Resources Board, Inuvialuit Game Council, Parks Canada, academic researchers and community wildlife monitors who participated in the surveys. An online forum meeting is scheduled for May 2021 with various IGO and other partners in the Sahtú, as well as community members, to discuss the results of the survey. A report for 2020 and 2021 surveys is currently being compiled.</p>	<p>Initiated</p>
<p>7.7 Human health and well-being</p> <ul style="list-style-type: none"> Support health vulnerability assessment(s) by external parties (e.g. consultants, researchers, etc.) to evaluate the impact of climate change on the physical and mental health and social well-being of northern communities Work with partners and the public to establish the requirements for a baseline surveillance and monitoring system for health-related climate change indicators such as mental health and social well-being, injuries, food and water security, environmental contaminants, extreme weather events and natural disasters, zoonotic diseases, chronic diseases and infectious disease 	<p>HSS, ENR, MACA</p>	<p>The Climate Change Health and Vulnerability Assessment (CCHVA) for the NWT was completed in early 2021. Data from climatedata.ca was analyzed to identify current and potential future climate change impacts (e.g., extreme temperature, wind, drought and precipitation projections) for each eco-region within the NWT. Based on the information collected from the study, current and future health impacts on the population were identified, including those communities and population groups who may experience disproportionate health impacts due to climate change.</p> <p>The project report has provided suggested adaptation strategies that may enable the affected communities and vulnerable populations to adjust to incremental environmental changes and climate change. The report also provided a baseline for the current level and availability of essential health services and next steps for assessing the resilience of these services during extreme weather and climate-related events, such as working with communities, establishing monitoring programs, and initiating the proposed adaptations. A summary of the CCHVA will be provided in plain language. Both the full report and plain language summary are under review and will be made available to the public in 2021.</p>	<p>Initiated</p>

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>7.8 Public safety</p> <p>a. Update the NWT Hazard Identification Risk Assessment to better predict which hazards could occur more frequently or become more extreme in the future</p> <p>b. Develop disaster mitigation plans for communities potentially impacted by the adverse effects of climate change</p> <p>c. Evaluate approaches to improve flow monitoring, flood prediction and emergency planning</p> <p>d. Monitor the condition of community trails</p>	<p>MACA, ENR, Sea-Ice Monitoring and Real-Time Information for Coastal Environments (SmartICE), ECCC, Community Governments, IGOs, GNWT, Academia</p>	<p>The NWT Hazard Identification Risk Assessment will identify risks, including climate change driven risk, that pose the greatest threat to the people, property, environment and economy of the NWT. Due to resource and staff allocation to the COVID-19 Emergency Response, the 2020-2021 update has been put on hold until 2021-2022. A project initiation meeting is planned for early 2021-2022. This project is supported by the Climate Change Preparedness in the North program.</p>	<p>Initiated</p>
<p>7.9 Culture and heritage</p> <ul style="list-style-type: none"> Conduct vulnerability mapping for heritage resources at risk of destruction from coastal erosion in the Beaufort Sea Region 	<p>ECE, Academia, IGOs</p>	<p>Though archaeological fieldwork involving IGOs was cancelled due to COVID-related restrictions, progress was made on the development of coastal erosion maps and models for significant archaeological sites in the Kugmallit Bay region on the Beaufort Sea Coast to support a vulnerability assessment. Additionally, coastal erosion maps and models of significant archaeological sites were developed in preparation for community engagement sessions, which have been delayed to fall/winter 2021 due to the COVID-19. This project is supported by the Climate Change Preparedness in the North program.</p>	<p>Initiated</p>
<p>7.10 Community infrastructure</p> <ul style="list-style-type: none"> Prioritize community infrastructure gaps to mitigate the impacts of climate change 	<p>MACA, Community Governments</p>	<p>In 2020-2021, MACA worked with a consultant to prepare a template for operations and maintenance plans for community drainage systems. The project examined northern climate change and drainage practices. The report was completed in late March 2021 and will be shared with communities. MACA will work with community governments that have an interest in developing a community specific drainage operations and maintenance plan moving forward.</p>	<p>Initiated</p>

GOAL 3: BUILD RESILIENCE AND ADAPT TO A CHANGING CLIMATE PART 1

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.1 Implementing the GNWT Land Use Sustainability Framework	A. Integrate climate change adaptation and mitigation factors into GNWT decision processes affecting land, water and natural resources	Lands, GNWT	The Land Use and Sustainability Framework (LUSF) is intended to guide internal GNWT decisions on land, water, and natural resources. Early work on the LUSF included a cross departmental effort to identify and compile a draft set of nine LUSF objectives, one of which is climate change mitigation and adaptation. In 2020-2021, the Department of Lands worked on further refining an approach, called a sustainability appraisal, to assist GNWT departments in understanding how to best use the LUSF and how to consider the LUSF objectives in GNWT decision-making. The approach is currently undergoing internal review.	Initiated
	B. Develop climate change indicators	ENR, GNWT	<p>Work was initiated on the development of several climate change indicators to inform reporting for NWT State of the Environment. These indicators include:</p> <ul style="list-style-type: none"> • trends in global environmental changes • trends in global CO₂ concentrations • global climate teleconnections • trends in observed temperature and precipitation in the NWT • trends in lightning events • projected trends in temperature and precipitation in the Arctic • trends in Arctic sea ice and sea surface temperature • trends in Beaufort sea ocean acidification • trends in Arctic sea ice and sea surface temperature <p>There are also several indicators related to water, wildlife, vegetation, permafrost, species at risk, landscape change, harvesting, country food use, protected areas and human activities that link to climate change being developed. In 2021-2022, ENR will further expand and develop climate change indicators, including determining if existing SOE indicators can be integrated into the expanded set of climate change indicators.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.2 Completing / reviewing regional land use plans	A. Work collaboratively within regional planning processes to incorporate climate change considerations into land use plans	Lands, ENR, ITI, ECE, EIA, IGOs, Federal Government, Land Use Planning Boards and Committees	<p>A jurisdictional review of how climate change considerations are incorporated into regional land use plans was completed. Additionally, Lands coordinated GNWT input into regional land use plan reviews and amendments -- which included bringing forward the GNWT's climate change considerations.</p> <p>In 2020-2021, the Sahtú Land Use Planning Board released a draft amendment to amend the land use plan following the establishment of the Ts'udé Nl'jíné Tuyeta Protected Area. The Department of Lands coordinated input across the GNWT, and comments were provided to the Sahtú Land Use Planning Board in October 2020, December 2020, and April 2021. The comments are available on the Board's public registry.</p>	Initiated
3.3 Implementing the conservation network	A. Establish Thaidene Néné candidate protected area	ENR, IGOs, PCA, Lands, ITI, EIA, DOJ	The GNWT established the Thaidene Néné Territorial Protected Area in August 2019. In 2020-2021, the Thaidene Néné Operational Management Board was formed. This Board is responsible for development of the management plan for Thaidene Néné. As active members, IGO and traditional and local knowledge holders' contributions are integral to managing the protected areas, further supporting our adaptation to known and understood impacts of climate change.	Completed
	B. Establish Dinàgà Wek'èhodi candidate protected area	ENR, IGOs, Lands, EIA, ITI, ECC (CWS)	<p>Work toward the establishment of Dinàgà Wek'èhodi candidate protected area continued in 2020-2021 and is ongoing.</p> <p>Biodiversity monitoring in the Dinàgà Wek'èhodi candidate protected area is ongoing and will contribute to future climate change research.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.3 Implementing the conservation network	C. Establish Ts'udé Niljné Tuyeta candidate protected area	ENR, IGOs, Lands, EIA, ITI, ECCC (CWS)	The GNWT signed an Establishment Agreement with the K'ahsho Got'jné for Ts'udé Niljné Tuyeta in September 2019, however, the protected area will not be considered established until the regulations have been completed through the Protected Areas Act. In 2020-2021, the Ts'udé Niljné Tuyeta Management Board was formed. This Board is responsible for development of the management plan for Ts'udé Niljné Tuyeta. As active members, IGO and traditional and local knowledge holders' contributions are integral to managing the protected areas, further supporting our adaptation to known and understood impacts of climate change. Biodiversity monitoring is ongoing and could contribute to future climate change research.	Initiated
	D. Conclude planning and decisions for remaining candidate areas	ENR, IGOs, Lands, EIA, ECCC (CWS)	Action Area 3.3D has not yet been initiated. Planning and decision-making processes for previously proposed candidate protected areas as per Healthy Land, Healthy People .	Not yet initiated
3.4 Applying permafrost expertise	A. Provide permafrost expertise for NWT projects and initiatives	ITI (NTGS)	ITI (NTGS)'s permafrost team receives numerous requests to provide permafrost expertise, ranging from requests for research and technical advice, data, publications, collaborations, presentations, and more. The team is developing a tracking system for requests received, to be implemented in 2021-2022. In 2020-2021, the team responded to all requests received, however could not provide comprehensive responses to all requests based on current capacity. With greater staff capacity (see 2.6G for further details on positions), ITI (NTGS)'s ability to provide comprehensive responses will increase in 2021-2022.	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>3.5 Implementing wildlife plans / strategies (key species, species at risk, invasive species)</p>	<p>A. Finalize and implement the Bathurst Caribou Range Plan, including the conservation of key habitats where climate change impacts are expected to be pronounced</p>	<p>ENR, Co-management Boards, IGOs, Industry, NGOs</p>	<p>The Bathurst Caribou Range Plan was finalized in August 2019. The plan, maps, and outputs of modelling undertaken during development of the plan are available online. Work was underway in 2020-2021 to fully implement all recommendations in the Plan. The NWT Recovery Strategy for Barren-ground Caribou was released in July 2020 and is used to guide research, monitoring, and management planning.</p> <p>The Bathurst Caribou Advisory Committee is made up of 16 Indigenous governments and organizations from across the range of the Bathurst caribou herd, along with territorial governments from the NWT and Nunavut. The Committee advises on the management of Bathurst caribou and its habitat and in 2020-2021, it held three workshops to discuss areas of important habitat to be considered for conservation. Committee members informed discussions with Indigenous knowledge from their communities on areas of important habitat and cultural and biogeographical hotspots. A literature review was conducted and support materials were developed to guide work into 2021-2022.</p> <p>An online workshop was held in February 2021 to further develop the vision, goals and objectives of the Caribou Guardians Coalition, which is envisioned as an Indigenous-led network of community monitoring programs across the range of the Bathurst herd. Following the Indigenous Guardians Toolkit and learning from other Indigenous-led programs, the Caribou Guardians Coalition will continue to evolve and has funding support from Polar Knowledge Canada for the next two years.</p>	<p>Completed</p>

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>3.5 Implementing wildlife plans / strategies (key species, species at risk, invasive species)</p>	<p>B. Finalize the Boreal Caribou Range Plans, including management of climate change impacts on the ecosystem</p>	<p>ENR, ECCC, Co-management Boards, IGOs, Industry, NGOs</p>	<p>The Northwest Territories Framework for Boreal Caribou Range Planning was finalized in August 2019 and continues to guide five regional range plans, which include management of climate change impacts on ecosystems, that are being developed for the NWT portion of the boreal caribou habitat range (Southern NWT, Wek'èezhìi, Gwich'in, Inuvialuit and Sahtú). ENR released its first quarterly newsletter on Boreal Caribou Range Planning in August 2020.</p> <p>The Southern NWT, Wek'èezhìi, Gwich'in and Inuvialuit boreal caribou range planning working groups have been formed and each met in 2020-2021 and work to develop the regional range plans is ongoing. They include representatives from IGOs and renewable resources boards. Virtual meetings were held to discuss the formation of a fifth regional range planning work-ing group in the Sahtú in fall 2020. ENR held 17 community mapping workshops to review, update and verify traditional and local knowledge about important areas for boreal caribou, and to discuss community-specific development interests and plans across the southern NWT.</p> <p>To better understand boreal caribou habitat selection, ENR completed a habitat-selection analysis modeling project in May 2020 using collar data collected from boreal caribou across the NWT. The habitat selection models and maps are being used to develop the range plans and in the Western Boreal Initiative, a project being led by the Canadian Wildlife Service (Environ-ment and Climate Change Canada) and Natural Resources Canada.</p>	<p>Initiated</p>

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.6 Capturing carbon in forests	A. Increase forest carbon sequestration by silvicultural practices including planting in areas that have not returned to forest after natural disturbances, and thinning in areas that are overly dense	ENR, INF, ECCC	Due to COVID-19 travel restrictions on non-NWT academic researchers, thinning and planting programs were deferred and expected to be implemented in 2021-2022.	Initiated
3.7 Responding to human health risks	A. Promote and support health and wellness activities to build community resiliency to climate change impacts	HSS, ENR, Community Governments, IGOs	Due to COVID-19, in-person community outreach was not possible in 2020-2021. HSS is working on an adjusted engagement plan for 2021-2022, which will include discussions with communities on which educational materials would be most beneficial. Materials related to flooding impacts on health and health services are also being produced.	Initiated
	B. Work with communities to identify potential cleaner air shelters, and modifications required to reduce impacts of wildfire smoke on human health	HSS, Community Governments, IGOs	The Cleaner Air Sheltering in the NWT report, initiated last year, has been delayed due to HSS capacity being focused on the COVID-19 response. All 33 communities did identify facilities suitable for use as cleaner air shelters and extreme heat cooling centres in 2019-2020.	Initiated
3.8 Increasing local food security and production	A. Support country food-related research, including climate change impacts to community food security	ENR, HSS, ITI, IGOs	Funding previously secured from the Canadian Institutes of Health Research has been distributed to communities and regions, including the Inuvialuit Settlement Region, the Tłı̨chǫ, the Sahtú, and Kakisa. Projects, related to local/regional-level climate change, Indigenous health and food security concerns, were initiated in 2020-2021. The research team (including community research leads, academic partners and GNWT) meets quarterly to discuss progress, governance, funding, planning, synthesis, and knowledge sharing.	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.8 Increasing local food security and production	B. Implement a sustainable livelihoods action plan to support country food research and programs	ITI, IGOs, Community Governments	Various actions in the Sustainable Livelihoods Action Plan 2019-2023 were advanced in 2020-2021. Climate change is one of the plan's guiding principles. To support action 4.5 of the Sustainable Livelihoods Action Plan, a Food Systems Planning workbook is being developed and expected to be released in 2021-2022.	Completed
	C. Implement the NWT Agriculture Strategy to increase local food production	ITI, IGOs, Community Governments	<p>The NWT Agriculture Strategy was approved and released in 2017. The Strategy has approved annual funding for implementation until 2022. Due to a lack of historical data on commercial food production in the NWT, ITI created a baseline dataset in 2017-2018 to accurately capture various sector metrics across the NWT and monitor the implementation and impact of the NWT Agriculture Strategy.</p> <p>Since the initiation of the NWT Agriculture Strategy, there has been steady year-over-year growth of reported volumes of food produced in the NWT. The total growth in production volume from community groups and commercial producers funded by GNWT from 2018 to 2020 is 40,000 pounds, an increase of almost 18%.</p>	Completed
3.9 Improving capacity and resilience of health and social services	A. Assess if essential services can be provided during extreme weather and climate-related events	HSS	Two tabletop exercises for healthcare facilities were completed in 2020-2021 (Fort Smith hospital and Hay River hospital) to assess whether essential services can be provided during extreme weather and climate-related events. Additional communities will be assessed on a rotating basis.	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.10 Updating community emergency plans and operations and maintenance procedures	A. Address climate-related hazards and adaptation measures in updated community emergency plans and operations and maintenance procedures (e.g. floods, blizzards, wildfires, permafrost thaw, coastal erosion)	Community Governments, MACA, IGOs, ENR, NRCan	In 2019-2020, 18 community governments had emergency plans that were less than five years old and reflected updated information about climate change hazards/risks. In 2020-2021, these statistics were not compiled. Instead, MACA worked with communities to update their emergency response plans with a focus on adding pandemic-specific sections to the plans.	Initiated
3.11 Enhancing wildfire disaster mitigation	A. Update and implement community wildfire protection plans	Community Governments, ENR, MACA	All 29 forested communities in the NWT have updated community wildland fire protection plans and recommendations are being implemented in communities, as part of the ENR's standard business operations.	Completed
	B. Support the implementation of FireSmart principles and consider the use of FireSmart programs for all communities	ENR, MACA, Community Governments	<p>Due to COVID-19, fire prevention outreach evolved from the traditional face-to-face opportunities to COVID-friendly opportunities. ENR led initiatives including: a "FireSmart Starts in Your Backyard" contest which was held in the summer of 2020, where residents completed a FireSmart assessment of their home, funds were provided to communities through locally-based agencies, and a webinar was co-hosted with MACA for community governments on implementing the Community Wildfire Protection Plan and FireSmart into their planning. FireSmart promotes cross-training and interagency cooperation to empower the public and increase community resilience to wildfire.</p> <p>In 2020-2021, five communities (Fort Smith, Yellowknife, Fort Simpson, Inuvik and Norman Wells) were provided funds to promote the FireSmart program in their communities through their local fire departments and public works departments.</p>	Completed

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.11 Enhancing wildfire disaster mitigation	B. Support the implementation of FireSmart principles and consider the use of FireSmart programs for all communities	ENR, MACA, Community Governments	ENR also supported the implementation of FireSmart initiatives in 12 communities across all regions of the NWT. Currently, every NWT community potentially at risk from wildfire has a Community Wildfire Protection Plan in place. These plans are designed to identify and reduce wildfire risk in communities. In 2020-2021, six communities either completed a new fuel break or maintained/widened an existing fuel break based on their Community Wildfire Protection Plans.	Completed
3.12 Community hazard mapping	A. Design a hazard mapping program, including permafrost, flooding, wildfire, erosion and other climate-related impacts	ENR, MACA, Lands, ITI, NWTAC, Community Governments, NRCan, Academia	The Community Climate Change Hazard Mapping Project Advisory Team met twice in 2020-2021. The Team was led by ENR and included representatives from across government and the NWTAC. A desktop geotechnical study was completed for Tuktoyaktuk, which will support a future pilot community hazard mapping project. The geotechnical study was integrated into a prototype online mapping tool to allow for the sharing of hazard information. This work will support the design of a comprehensive community hazard mapping program. ENR, MACA, and NWTAC participated in a national working group to develop a National Standard for Land Suitability Mapping (also known as hazard mapping). This standard is being developed by the Standards Council of Canada (SCC) and will be a component of the Northern Infrastructure Standardization Initiative. This standard is expected to be completed in 2022 and will support consistent approaches for hazard mapping across communities (see 7.3, 7.8, 8.3 and 8.9 for further work supporting this action item.)	Initiated
3.13 Safely accessing land, water and ice	A. Pilot community focused ice information products to support on-ice travel and travel in ice filled waters	ECCC (CIS and CCCS), ENR	Work on the development of community ice information products for Sachs Harbour, Tuktoyaktuk and Ulukhaktok (initiated in 2019-2020) did not advance in 2020-2021 due to the COVID-19 pandemic. This project has been delayed by one year and is expected to be completed by March 2022.	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.13 Safely accessing land, water and ice	B. Implement the SmartICE monitoring and information service in select NWT communities to facilitate safe passage over ice	SmartICE, IGOs, Community Governments	<p>SmartICE is a climate change adaptation tool that integrates Indigenous knowledge of sea ice with advanced data acquisition and remote monitoring technology. In 2020-2021, in partnership with the Inuvialuit Game Council, SmartICE deployed ice-monitoring equipment in the Inuvialuit communities of Ulukhaktok and Tuktoyaktuk, and trained Munaqsiyit monitors from Inuvik, Paulatuk, Ulukhaktok and Tuktoyaktuk in the equipment's operation. As part of the training, monitors learned how their ice monitoring data and associated maps are instantly viewable in their communities through SIKU (www.siku.org), an Indigenous knowledge social network.</p> <p>In early 2021, SmartICE partnered with the Tłı̄chǫ Government to engage with the communities of Behchokǭ, Whati, Gamèti, and Wekweètì to help document Indigenous knowledge of ice travel safety. The purpose was to increase awareness of changing ice conditions through the co-development of safety messaging that uses Indigenous knowledge and practices of ice travel. In 2021-2022, engagement on ice travel safety practices will continue with the Tłı̄chǫ Government and the GNWT. Ice monitoring demonstration projects in other NWT communities are under discussion and there are plans to deliver ice monitoring equipment and training to Munaqsiyit monitors in Sachs Harbour.</p>	Completed
	C. Incorporate extreme weather warnings into public alerting system	MACA, ECCC	<p>In 2020-2021, MACA developed the NWT Alert Ready Program Guidelines. The NWT Alert public launch is planned for early 2021-2022.</p> <p>Communities were offered the ability to use NWT Alert in 2020-2021 to provide emergency alerts to their residents in extreme weather situations, even though the system had not been publicly launched. The Town of Hay River used NWT Alert to notify their residents to evacuate during high flood in 2020-2021.</p>	Completed

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.14 Supporting the Northern Infrastructure Standardization Initiative (NISI)	A. Continue active participation in the development of additional standards for northern infrastructure (NISI Phase II)	INF, MACA, SCC, ENR, NWTAC	INF continued to contribute to the development of Standards Council of Canada (SCC) Northern Infrastructure Standardization Initiative (NISI) Standards, which focus on protecting infrastructure under a changing climate. INF serves as a member of the Northern Advisory Committee (NAC) and on working committees for NISI standards. Since 2011, 14 new standards and a series of guidebooks have been created, which INF and other departments reference in infrastructure contracts for planning, design, construction, risk management, maintenance and decommissioning of assets, as applicable.	Completed
3.15 Adapting infrastructure to a changing climate	A. Construct the Tłjchq All Season Road	INF	Construction continued in 2020-2021 on the Tłjchq Highway to provide a year-round connection from Whatì to Highway 3: 97 km of embankment construction, 3 out of 4 bridges, and 45 km gravel surfacing were completed. Replacing the southern section of the existing winter road will provide uninterrupted access to Whatì and increase the winter road window of access to Gamètì and Wekweètì. This will strengthen the resiliency of these communities to the impacts of climate change, while reducing the cost of living for the region and creating new social opportunities. Construction will resume in May 2021. The project is on track for substantial completion (road open for traffic) in November 2021 and final completion in November 2022.	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
3.15 Adapting infrastructure to a changing climate	B. Construct the Great Bear River Bridge	INF	<p>Although geotechnical investigation drilling and an associated report was completed, this project has been delayed as community access has been restricted in response to the COVID-19 pandemic.</p> <p>The purpose of this project is to construct a 460-metre-long, 2 lane, 5-span bridge over the Great Bear River near the community of Tulita. Construction of the Great Bear River Bridge would eliminate a major bottleneck along the existing Mackenzie Valley Winter Road. Constructing a permanent structure over the Great Bear River would increase the security of travelers and eliminate a major obstacle to the resiliency and effectiveness of this route.</p>	Initiated
	C. Complete permitting and construct the Mount Gaudet & Prohibition Creek All Season Roads	INF	<p>The federal Climate Lens assessment is used to anticipate, prevent, respond and adapt to climate change related impacts, as well as estimate the GHG emissions of infrastructure projects funded by the federal government. The Climate Lens assessment was completed for the Mount Gaudet and Prohibition Creek all-season road projects in 2020-2021.</p> <p>Regulatory authorizations for construction of the Prohibition Creek Access Road project were issued in the fall of 2020. Additional geotechnical assessments were completed in 2021 to inform final design, which is currently underway, in anticipation of construction starting in winter 2022.</p> <p>Regulatory authorizations for construction of the Mount Gaudet Access Road project were submitted in the fall of 2020. The regulatory review is currently paused, though engagement still continues.</p>	Initiated

PART 2

Further funding will be required to fully implement these Action Areas.

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>8.1 Habitat management, biodiversity and restoration</p> <ul style="list-style-type: none"> Undertake a gap analysis for the NWT Biodiversity Action Plan Develop strategies to prevent, as well as adapt to, invasive and non-indigenous wildlife, fish, marine mammal, insect and plant species 	<p>ENR, NWT CISPP, ECCC, NGOs, IGOs</p>	<p>ENR is developing an overall Climate Change Adaptation Strategy for Wildlife in the NWT, alongside its co-management partners. This is an important step towards increased co-ordination and accountability by the GNWT to adapt to climate change. In 2020-2021, 44 people were interviewed to assess what goals and objectives should form the basis of climate change adaptation strategies for wildlife management in the NWT. Interviewees included Elders, youth, management practitioners, researchers and others. Two reports were developed based on interview results from Elders and youth, and practitioners and researchers. Findings from the interviews and a jurisdictional scan on similar strategies completed this year will inform a verification workshop and strategic drafting meeting in fall/winter 2021-2022 to support the adaptation strategy. This project is supported by the Climate Change Preparedness in the North program.</p>	<p>Initiated</p>
<p>8.2 Supporting regional priorities</p> <ul style="list-style-type: none"> Support communities experiencing impacts through focused resilience and adaptation initiatives 	<p>GNWT, IGOs</p>	<p>In 2020-2021, the GNWT wrote to, and met with, ECCC, CIRNAC, NRCan and other federal departments on several occasions – from the working level through to the ministerial level – to advocate for federal funding to support action on climate change in the NWT. Emphasis was put on the need for funding and support to build community capacity, improve critical knowledge of climate change impacts, and assessing impacts to build resilience and adapt to a changing climate.</p>	<p>Initiated</p>
<p>8.3 Applying geohazard expertise</p> <ul style="list-style-type: none"> Increase technical capacity for addressing climate change related geohazards in development applications and public and community infrastructure 	<p>Lands, ITI (NTGS)</p>	<p>The Department of Lands developed a job description for a geotechnical advisor position in 2019-2020 and the position was staffed in July 2021.</p>	<p>Completed</p>

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>8.4 Permafrost research coordination and application</p> <ul style="list-style-type: none"> • Ensure permafrost research conducted by Canadian and international agencies is coordinated and communicated to inform NWT decision-making 	<p>ITI (NTGS)</p>	<p>ITI (NTGS) staff have worked closely with the Canadian Permafrost Association to advance permafrost research in 2020-2021. In 2020-2021 ITI (NTGS) continued to play a significant role on the Board of Directors to support organizational development including associated working groups. In addition to this participation, INF has continued participation in Canadian Permafrost Association meetings throughout 2020 2021 and worked closely with ITI (NTGS) and other partners through the association on permafrost research on northern infrastructure. This significant involvement by the GNWT at the national level highlights the importance of advocating for support, whether through direct funding, partnerships or collaborations.</p> <p>ITI (NTGS) is also involved in the Canadian Permafrost Network and in the development of a Canadian Standard for Risk-based Mapping in Northern Communities. Participation in these national organizations helps inform permafrost research being undertaken in the NWT which is key to informing adaptation planning.</p>	<p>Completed</p>
<p>8.5 Implementing wildlife plans / strategies (key species, species at risk, invasive species)</p> <ul style="list-style-type: none"> • Work with wildlife co-management partners to consider and address climate change impacts on habitat for all barren-ground caribou herds within the NWT • Implement an overall climate change adaptation strategy for wildlife management • Consider regulatory amendments (seasons, conditions and areas) to the Wildlife Act depending on changes in species distribution 	<p>ENR, ECCC, Co-management Boards, IGOs, Industry, NGOs</p>	<p>A new Climate Change Adaptation Ecologist will augment ENR's capacity to support the integration of climate change considerations in wildlife management, including the future implementation of a climate change adaptation strategy for wildlife management in the coming years.</p>	<p>Initiated</p>
<p>8.6 Responding to human health risks</p> <ul style="list-style-type: none"> • Develop and deliver educational and outreach materials to support communities in building resiliency and adapting to human health concerns 	<p>HSS, ENR, NWTAC</p>	<p>In 2020-2021, HSS began developing resources on flooding and poor air quality to support communities in adapting to climate change-related health concerns. They are expected to be completed in 2021-2022.</p>	<p>Initiated</p>

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>8.7 Increasing local food security</p> <ul style="list-style-type: none"> • Building on the priorities to be identified in a sustainable livelihoods action plan, work collaboratively with partners to identify and secure funding to support projects • Invest strategically in food production opportunities that address climate change risk mitigation through the implementation of the NWT Agriculture Strategy and Canadian Agriculture Partnership between the GNWT and the federal government. 	<p>ENR, ITI, HSS, EIA, IGOs, Community Governments, Academia</p>	<p>The Canadian Agricultural Partnership is a suite of programs and funding designed to help support agriculture, specifically to increase production of local agricultural products in the north. The Canadian Agricultural Partnership is funded by both the Government of Canada and the GNWT until 2023, by which time \$5.6 million will have been invested in the NWT agriculture sector. In February 2021, the federal and territorial governments announced over \$400,000 of funding to three projects (Riverside Growers, Greenwood Gardens, and Choice North Farms) based in Hay River. The 2020-2021 report on funding allocated under the partnership will be available in fall 2021 through the Department of ITI's grants and contributions report.</p> <p>In 2020-2021, ENR launched the following funding programs that supported land-based activities and food security: the Take a Family on the Land program (ongoing), the COVID-19 Harvesting subsidy (one-year program) and the Regional Community Knowledge Exchange program (one-year program).</p> <p>The GNWT, in collaboration with multiple Indigenous governments and organizations, as well as academic partners, secured funding for community-based research focused on climate change, food security and Indigenous health. See 3.8A for further details on the funding.</p>	Completed
<p>8.8 Enhancing wildfire disaster mitigation</p> <ul style="list-style-type: none"> • Establish modified community fuel breaks based on a risk-management approach 	<p>ENR, Infrastructure Canada</p>	<p>The GNWT is actively working with communities on fire breaks, despite not being able to access funding through the federal Disaster and Mitigation Action Fund – see 3.11 A and B.</p>	Initiated
<p>8.9 Community hazard mapping</p> <ul style="list-style-type: none"> • Develop outstanding components of the hazard mapping program, including permafrost, flooding, wildfire, erosion and other climate-related impacts. • Provide information and training to communities to use hazard maps 	<p>ENR, MACA, Lands, ITI, NWTAC, Community Governments, Academia</p>	<p>To support future community hazard mapping components, ENR (in partnership with the NWT Centre for Geomatics) acquired InSAR data for communities and other areas of interest in 2020-2021.</p> <p>Hazard components, including thermokarst mapping (see 7.3 for further details on the project), will be integrated into the hazard mapping program.</p>	Initiated

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>8.10 Protecting threatened heritage resources</p> <ul style="list-style-type: none"> • Conduct detailed studies/ excavations of significant heritage resources at threat of destruction from climate-driven processes • Develop remote sensing-based monitoring protocols for heritage resources at risk of impact 	ECE, Academia, IGOs	ECE developed coastal erosion maps and models using high-resolution satellite imagery, which will form the basis of remote sensing-based monitoring efforts. Due to COVID-19 restrictions, fieldwork and community meetings and visits were deferred to next year (see 7.9 for further details on the project).	Initiated
<p>8.11 Upgrading public and community infrastructure</p> <ul style="list-style-type: none"> • Prepare and submit federal funding application for planning and environmental studies for the Slave Geological Province Road • Development of a collaborative GNWT and Yukon Government climate research network using existing and additional monitoring instrumentation and coordinating new research and development projects along the Inuvik-Tuktoyaktuk and Dempster highways • Undertake improvements, as needed, to respond to specific climate change related impacts to infrastructure 	INF, Yukon Government, Community Governments, MACA	<p>Improvements are undertaken, as needed, to respond to specific climate change related impacts to infrastructure. In July and August 2020, a section of the shoulders of Dempster Highway collapsed due to a thaw slump. A monitoring program was subsequently implemented at kilometer 28.5 on Dempster Highway to monitor the thaw slump locations.</p> <p>INF completed a geotechnical and structural assessment of GNWT buildings founded on adfreeze steel piles that have the potential to cause structural distress as a result of excessive foundation settlement due to climate change over the expected life of the asset. This was a desktop study completed in 2020. The results will inform design of facilities and operations and preventative maintenance inspections. This project is supported by the Climate Change Preparedness in the North program.</p>	Initiated
<p>8.12 Responding to risks to private infrastructure</p> <ul style="list-style-type: none"> • Provide guidance and information to the public regarding risks and management options for privately owned infrastructure affected by climate change 	ENR, Community Governments, GNWT	A number of GNWT projects were underway in 2020-2021 that will support the provision of guidance and information to the public regarding risks and management options for infrastructure that could be impacted by climate change. These projects include community hazard mapping, the climate change outreach plan (see 3.12A, 4.4A, 4.7B, 8.9 for further details on these projects). Further, FireSmarting is an ongoing program providing homeowners with information and guidance on protecting their home from wildfire (see 3.11B for further details on FireSmarting).	Initiated

CROSS-CUTTING: LEADERSHIP, COMMUNICATION AND CAPACITY-BUILDING AND ECONOMIC IMPACTS AND OPPORTUNITIES

PART 1

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
4.1 Reflecting climate change in governance and policy tools	<p>A. Establish internal GNWT guidance mechanisms¹¹:</p> <ul style="list-style-type: none"> • Director-level Climate Change Working Group • Assistant Deputy Ministers Climate Change Committee • Deputy Ministers Energy and Climate Change Committee • Energy and Climate Change Committee -of-Cabinet 	GNWT	<p>This action item was completed in 2019-2020 when all committees were established. The committees continued to meet in 2020-2021 (frequencies as follows: monthly Director’s Working Group, monthly Deputy Minister’s Energy and Climate Change, monthly Committee-of-Cabinet, as needed Assistant Deputy Minister Energy and Climate Change). Climate change is a mandate priority and of importance at all levels within the GNWT, hence the need to continue to use these committees to ensure an integrated response to climate change.</p>	Completed
	<p>B. Coordinate GNWT climate change related project work</p>	ENR, GNWT	<p>The first Annual Report of the 2019-2023 NWT Climate Change Action Plan was released for 2019-2020. It was released concurrently with the Energy Initiatives Report 2019-2020, the NWT Carbon Tax Annual Report 2019/20, and a Plain Language Overview of the three annual reports.</p> <p>In 2020-2021, ENR also coordinated progress reporting for the Pan-Canadian Framework and input into Canada’s new Strengthened Climate Plan and associated initiatives.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
4.1 Reflecting climate change in governance and policy tools	C. Add climate change considerations to new / revised territorial legislation and policies	ENR	As of January 2021, all decision papers, FMB submissions and Legislative Proposals need to consider climate change factors. These climate change factors include mitigation, impacts and adaptation.	Completed
	D. Complete a jurisdictional scan of effective policy tools to support the Action Plan's implementation	ENR, GNWT	ENR continued to participate in Canadian Council of Ministers of the Environment committees, including the Climate Change Committee, and regularly provided input into work planning and the development of nationally relevant guidance. Guidance on Good Practices in Climate Change Risk Assessment was approved by the provincial, territorial and federal governments in late 2020-2021. ENR's active participation in the Pan-Territorial Adaptation Planning committee allowed for continued knowledge exchange on policy tools that support action on climate change knowledge and adaptation.	Initiated
	E. Include climate change content in existing community and Indigenous government training resources, and expand online governance training to include climate change	MACA, ENR, NGO	MACA, ENR, NGO MACA, through the School of Community Government, offers a regular series of webinars on a wide range of topics of interest to community governments. While various courses have been developed with a specific focus on climate change (see 4.6C for further details), other courses will include climate change considerations as appropriate should they be updated in the future.	Initiated

¹¹ This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
4.2 Pursuing funding sources for climate change initiatives	A. Develop funding requests to address climate change priorities	ENR, GNWT, IGOs	<p>Funding was secured in fall 2020 for 15 new positions and some operational funds across 5 departments to support the implementation of the Climate Change Action Plan, with a focus on Part 2 action areas.</p> <p>In addition to seeking internal funds, external funding was pursued via requests to federal departments from the Minister of ENR (December 2020 & March 2021), prior to and following the announcement of the new federal Strengthened Climate Plan in December 2020.</p> <p>Meetings between GNWT departments and key federal departments took place throughout 2020-2021 to voice concerns and request support to continue to progress on climate change mitigation, knowledge and adaptation actions. The Minister of ENR met with the federal Minister of Environment and Climate Change on several occasions, and continuously raised concerns related to climate change and the need for support Indigenous, community and territorial governments to strengthen their response to climate change.</p>	Initiated
4.3 Establishing external guidance mechanisms to foster collaboration	A. Develop options for the establishment of an NWT climate change council or advisory body ¹²	GNWT, IGOs, NWTAC, NGOs, Industry	<p>In March 2021, the GNWT formally established the NWT Climate Change Council, following planning meetings throughout 2020-2021. ENR serves as the secretariat and is also the co-chair of the Council along with an IGO co-chair who was nominated by other IGO representatives. Although the establishment of the Council was delayed until late 2020-2021 due to COVID-19, online meetings took place over the winter and the Terms of Reference for the Council were formalized in March 2021. As the Council gains experience and momentum, it will play a significant and critical role in advising the GNWT on key climate change priorities.</p> <p>Membership of the Council includes representatives from IGOs, the NWTAC, INF and ENR.</p>	Completed

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
4.4 Information sharing and education initiatives	A. Develop and implement a climate change outreach and communication plan ¹³	ENR	<p>The Climate Change Outreach Plan has been drafted and is currently under review, as more strategic planning is underway. Despite the challenges due to COVID-19, outreach support was provided to a number of communities, IGOs, academics, NGOs and GNWT departments. This included building awareness of resources (such as climate change funding opportunities, data, reports, webinars, and partnerships). ENR also aided with funding applications. Communicating online became the norm during 2020-2021, and GNWT and its partners were quick to adapt to this new way of connecting, participating in meetings, and attending virtual webinars and conferences.</p> <p>Additionally, ENR funded Ecology North to run a youth-led climate change social media project, which provided youth with social media training and an opportunity to develop and publish communications focused on climate change. Nine youth from across the territory took part in the training and 13 social media posts were developed and shared.</p>	Initiated
4.5 Supporting community-based monitoring efforts	A. Continue community-based monitoring and implement additional community-based monitoring sites on a priority basis	ENR, MACA, IGOs, Community Governments	Six NWT-based projects were federally funded through the Indigenous Community-Based Climate Monitoring program in 2019-2020, with funding continuing into 2020-2021. Funding was provided to Tuktoyaktuk Community Corporation, Arctic Borderlands Ecological Knowledge Society, Northwest Territory Métis Nation, K'at'odeeche First Nation, Inuvialuit Regional Corporation Joint Secretariat, and Dehcho First Nations.	

¹² This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

¹³ This action item intends to address recommendations from Office of the Auditor General of Canada's 2017 report on climate change in the NWT. Refer to the 2030 NWT Climate Change Strategic Framework (Appendix A) for further details.

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
4.6 Training for Indigenous and community governments	A. Ensure residents, first responders, communities and the GNWT are trained to be better prepared to deal with the impacts of all hazards, ranging from low through to very high risks	MACA, Community Governments, NWTAC, IGOs, ECCC	No training opportunities specific to climate change-related hazards were offered in 2020-2021 due to COVID-19. One webinar was planned in early 2021-2022 on climate change adaptation and mitigation. However, it was postponed due to spring flooding emergencies. In the future, training will be updated to include climate change considerations, as and when appropriate.	Initiated
	B. Deliver workshops on adaptation, mitigation and best practices	MACA, Community Governments, IGOs	Due to COVID-19, in 2020-2021 in-person training offered by the School of Community Government was limited to courses for essential service delivery, such as drinking water treatment.	Initiated
	C. Deliver climate change training through School of Community Government programming and workshops	MACA, ENR, NWTAC, LGANT, IGOs, Community Governments	<p>The School of Community Government continued to offer various climate change-focused courses. The following courses and webinars continued to be available in 2020-2021:</p> <ul style="list-style-type: none"> Integrating Climate Change Measures into Municipal Planning and Decision Making (course) Climate Change for Councilors (webinar) Mainstreaming Climate Change for Community Planning (webinar) Climate Change (webinar) Since April 2020, two people completed the course, and 14 people viewed the webinars. 	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
4.7 Adaptation planning and support (regional and local level)	A. Integrate adaptation planning into emergency management, community plan and strategic plan workshop content	ENR, MACA, NWTAC, Community Govern-ments	<p>Strategic and Community Plans are led by community governments. MACA supports these plans upon request. In 2020-2021, staff from MACA's School of Community Government worked with three community governments (Behchokò, Whatì and Gamètì) to review their Strategic Plans. Climate change mitigation and adaptation were topics of discussion during these sessions.</p> <p>Additionally, MACA's planning staff met with three Hamlet Councils to support the community plan bylaw review process; discussions were held on how land use planning tools can be used to support decisions on development and land administration, thereby adapting to or mitigating impacts of climate change. Two communities hired consultants to support the review and development of their community plans and the scope of this work included how climate change adaptation and mitigation can be incorporated into land use planning documents.</p> <p>As restrictions ease and the NWT emerges from the pandemic, MACA will reinvigorate efforts for in-person engagements with communities to provide support through focused training. Specifically, MACA will lead in-person reviews and discussion of strategic and emergency response planning where climate change is a topic of discussion.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
4.7 Adaptation planning and support (regional and local level)	B. Support regional or community adaptation planning and implementation of adaptation initiatives	ENR, INF, MACA, NWTAC, IGOs, Community Governments, Federal Departments	<p>ENR and INF partnered with the Northwest Territories Association of Communities for the second year in a row to fund the 2021 Climate Resiliency Award and 2021 Energy Excellence Award. The recipients were awarded virtually during the NWTAC's Annual General Meeting in February 2021. The Hamlet of Tuktoyaktuk received the Climate Change Resiliency Award from ENR, for their demonstrated leadership in adapting to climate change. Tsiigehtchic received the Energy Excellence Award from INF for their commitment to improving energy efficiency in the community.</p> <p>The NWTAC released a video, NWT Communities: On the Front Lines of Climate Change Adaptation, in the summer of 2020, created with support from the GNWT, to explain climate change impacts in the NWT and examples of adaptation in communities. This video also serves to help communities advocate widely for support within and outside of the NWT.</p> <p>ENR continued to represent the GNWT on the federally-led NWT Climate Change Adaptation Committee. This advisory group is made up of representatives from Indigenous governments and organizations, NWT Association of Communities, Aurora Research Institute, and the territorial and federal governments. Members provided advice and recommendations on project proposals to two federally funded programs: Climate Change Preparedness in the North (community stream) and Climate Change Health Adaptation Program. Funded projects support regional and community climate adaptation planning and implementation. Thirteen projects were funded in 2020-2021. Between the two programs, a total of \$2,041,769 was allocated for projects ranging from one to three years in length. A total of \$945,696 was spent in 2020-2021. Reporting on these projects is still forthcoming.</p>	Initiated

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
4.7 Adaptation planning and support (regional and local level)	B. Support regional or community adaptation planning and implementation of adaptation initiatives	ENR, INF, MACA, NWTAC, IGOs, Community Governments, Federal Departments	In the winter of 2021, ENR started planning to undertake a climate change risk and opportunities assessment. This work is part of the adaptation planning cycle and will be used to inform and prioritize adaptation and resiliency initiatives. This work will continue in 2021-2022.	Initiated

PART 2

Further funding will be required to fully implement these Action Areas.

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>9.1 Climate change information sharing and education initiatives</p> <ul style="list-style-type: none"> • Develop education resources focused on different audiences • Deliver regular workshops • Strengthen Indigenous knowledge-based initiatives to include a climate change component 	ENR, NWTAC, ECE, HSS, ITI, MACA, IGOs, Federal Departments	<p>Two presentations were delivered to high schools on the effects of climate change on permafrost and one presentation was delivered to a grade school on birds in the NWT, including a discussion on how climate change is impacting what birds we see in the NWT.</p> <p>Updates to the Hunter Education course were initiated in 2020-2021 to include climate change impacts and how they may impact travelling on the land safely. The updated course will be available in 2021-2022.</p>	Initiated

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>9.2 Training for Indigenous governments and organizations to support climate change monitoring</p> <ul style="list-style-type: none"> Support Indigenous Guardians Programs led by Indigenous governments in the NWT to monitor climate change using traditional, local and scientific knowledge where requested 	<p>IGOs, ENR, Federal Departments</p>	<p>ENR supports Indigenous-led Guardian initiatives in the NWT that monitor wildlife, habitat and cultural areas, support conservation, and create employment opportunities.</p> <p>The development phase for the BCRP Indigenous-led Caribou Guardians Coalition was initiated in 2020-2021. The Coalition is comprised of all IGOs on the Bathurst caribou herd range. An online workshop was held in February 2021 to further develop the vision, goals and objectives of the Caribou Guardians Coalition, which is envisioned as an Indigenous-led network of community monitoring programs across the range of the Bathurst herd. Following the Indigenous Guardians Toolkit and learning from other Indigenous-led programs, the Caribou Guardians Coalition will continue to evolve and has funding support from Polar Knowledge Canada for the next two years.</p> <p>Snowmobile operating and maintenance training was provided to the Yellowknives Dene First Nation in January 2021. The K'asho Got'Inę Guardians took part in the July 2020 training in Fort Good Hope for Small Vessel Operator Proficiency & Marine Emergency Duties, and boat maintenance and handling; training was facilitated by ENR. Additionally, biodiversity monitoring training was facilitated by the Conservation Planning Unit for the Edézhíe candidate protected area in February 2021 in Fort Providence.</p> <p>Training was provided for the Dehcho Guardians by ENR, as part of the Dehcho Aboriginal Aquatic Resource and Oceans Management (AAROM) program. In 2020-2021, the Guardians at Ts'udé Niljné Tuyeta also received training. The Rangers were limiting on the land programs due to COVID-19. Both will be receiving ongoing training in 2021-2022.</p>	<p>Initiated</p>

CROSS-CUTTING: ECONOMIC IMPACTS AND OPPORTUNITIES

PART 1

Action Areas	Action Items	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
4.1 Estimating the overall economic cost implications of the combined impacts that may occur in the NWT due to climate change	<p>A. Undertake a study focusing on:</p> <ul style="list-style-type: none"> • Impacts on infrastructure • Impacts on quality of life • Impacts on economic activities • Cost-benefit analysis of adaptation measures 	ENR, FIN, HSS, ITI, NWTAC	A report on the Cost of Climate Change and a plain language summary have been delayed due to focus on COVID-19 priorities. In 2020-2021, ENR met with NWTAC to discuss progress and timelines.	Initiated

PART 2

Further funding will be required to fully implement these Action Areas.

Action Areas	Lead, Potential Partners	Summary of Progress in 2020-2021	Status
<p>10.1 Undertaking sectoral assessments and adaptation planning</p> <ul style="list-style-type: none"> • Scope key sectors including, but not limited to, transportation, ice roads, mining, agriculture, forestry, tourism and fisheries to determine economic impacts and opportunities • Explore opportunities to collaborate with think-tanks, academics and international stakeholders regarding the costs and benefits of climate-related changes in the NWT 	<p>ENR, ITI, Industry, NGOs</p>	<p>ITI completed work on a model that will assess the economic impact of climate change on the NWT economy. The GNWT funded a new senior economist to support this work.</p> <p>ENR funded research on climate change and the potential socio-economic effects of communities resulting from reduced winter road access. Due to COVID-19 limiting in-person meetings, online focus group sessions were held with Wekweètì and Aklavik, along with interviews with GNWT departments. ITI provided an economic framework that captures the economic impact of climate change on winter roads. Further, literature reviews and data analyses were completed. A draft report was completed in March 2021 and the final report is expected to be completed in 2021-2022. This was a partnership between Wilfrid Laurier University, GNWT, Tłı̨chǫ Government, Wekweètì, Aklavik Hunters and Trappers Committee, and Ehdı̨ıtat Gwich'in Council with funding from the GNWT.</p>	<p>Initiated</p>
<p>10.2 Regional forest harvest that substitutes biomass for imported fossil fuels</p> <ul style="list-style-type: none"> • Assessment and implementation of community led harvesting for fuelwood for personal dwellings and district heating systems 	<p>ENR, INF, Community Governments</p>	<p>Action Area 10.2 has not yet been initiated. ENR is guiding, advising, and providing financial support to projects that substitute biomass for imported fossil fuels.</p> <p>Willow harvesting for commercial district heating is being utilized in Fort McPherson. ENR has undertaken an assessment of willow as a resource and has provided financial support to the development corporation to purchase a sawmill, as well as providing guidance when required.</p>	<p>Not yet initiated</p>

